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6 June 1978

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No. 39

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BRIEFS

BENIN-ALGERIA TELECOMMUNICATIONS AGREEMENT--A communique issued at the time of a 5-day visit to Algeria by Minister of Equipment Richard Rodriguez indicates that the two countries have agreed to cooperate in telecommunications matters. Among other things, specialized students from Benin will be able to complete their professional training at the Institute of Telecommunications in Algiers. [Text] [Paris INFORMATIONS D'OUTRE-MER in French 17 May 78 p 6]

CSO: 4400

BRIEFS

'NCNA', BANGLADESH COOPERATION AGREEMENT--Peking, 28 April (Hsinhua)--An agreement for cooperation on exchange of news between the Hsinhua News Agency and the Bangladesh Sangbad Sangstha was signed here this evening. Tseng Tao, director of the Hsinhua News Agency, and Abul Hashem, general manager and chief editor of the National News Agency of Bangladesh, signed the agreement. Attending the signing ceremony were Peng Ti, a leading member of the Hsinhua News Agency; Abdul Momin, Bangladesh Ambassador to China; and Hasanuzzaman Khan, chief news editor of the National News Agency of Bangladesh. After the signing ceremony, Tseng Tao gave a banquet in honor of the Bangladesh friends. Abul Hashem, Hasanuzzaman Khan and their party arrived in Peking yesterday as guests of the Hsinhua News Agency. [Peking NCNA in English 1543 GMT 28 Apr 78 OW]

CSO: 5500

BRIEFS

INTERSPUTNIK DEVELOPMENTS--At the fifth meeting of the council of the Intersputnik organization which was held in Berlin, new tasks and possibilities of development were the primary topic of discussion. Plans for distribution of the channels were approved, as were charges for their use. Charges identical to the charges for the given communications channel cosmic complex were adopted for the use of each earth station. At present the stations are combining their experiences and working out the statutes for the International Satellite Telecommunications System (MSZSZSZ). Among other things they are preparing the technical documentation of the technical equipment of the stations. Said documentation will be subject to facility inspection. Future plans call for multi-channel satellites to be placed in the area of the Atlantic and Indian oceans. These new satellites will make possible a significant increase in the capacity of the system: communications connections can be established with all continents of the earth. Intersputnik has worked out and is currently collating the plans of the documents which will determine the nature and concrete forms of cooperation with the International Radio and Television Organization (OIRT). [Excerpts] [Budapest MAGYAR HIRLAP in Hungarian 30 Apr 78 p 7]

CSO: 2500

COMMUNICATIONS OFFICIAL HOLDS PRESS CONFERENCE

Sofia BTA in English 0806 GMT 4 May 78 LD

[Text] Sofia, 4 May (BTA)--The first deputy minister of communications, Eng. Stoyan Markov, stated at a press conference here: "In the years of the Sixth and Seventh Five-Year Plans the material and technical base of the radio and television in Bulgaria has considerably developed. The powerful middle wave radio-stations, the result of integration with the Soviet Union, were built during this period in Vidin, Stara Zagora, Shoumen, Petrich and Kurdjali. The technical base of the first TV channel was further built, the scope of the second TV channel was considerably widened, and the ultra short wave radio broadcasting network enlarged. An earth station for space connections was also put into operation. This makes it possible to make intercontinental telephone, telegraph and phototelegraph connections, to transmit data and exchange TV and radio programs within the framework of the "INTERSPUTNIK" international space connection organization.

Eng. Markov pointed out that in recent years the wideband radio relay lines for radio and TV programs, for international connections and for carrying through the intercounty automation of telephone communications, have been widely applied in Bulgaria.

By the end of the seventh five-year period the first and second TV networks will have been built, and the construction of a third one to be completed by 1985, will have begun. Parallel with the main TV transmitters, the equipment for which is imported from abroad, the additional networks of TV retranslators develop as well, which are fitted out with Bulgarian-made equipment. At present there are 15 TV transmitters in Bulgaria, with a total capacity of 249.7 kw and 216 TV retranslators for the two channels.

The first deputy minister of communications also spoke about radio broadcasting in Bulgaria, which is effected through two national radio broadcasting networks, the radio and TV broadcasting facilities are on a modern technical level, any breaks due to technical causes are slight and minimized--an average of about one minute break per 100 workhours.

According to the program worked out till 1990 for improving the material and technical base of the radio and television, it is provided to build two middle and long wave networks, for (?USW) networks, three TV networks for black and white and color image, a radio-relay line for radio and TV programs between the county cities and some bigger industrial centers.

It is planned in the years to come to build a complex radio and television station on Mt. Vitosha, which will enable excellent transmission mainly for the Sofia and Pernik counties on 5 TV channels and 4 radio-channels at ultra-short waves, two of which [will be] stereo, automated radio-telephone systems will be mounted there, which will provide automatic telephone connections to mobile facilities.

Eng Markov emphasized that work goes on matters connected with the direct radio and TV broadcasting through earth satellites. In close cooperation with the "INTERSPUTNIK" member-countries, the transmission of radio and TV programs through satellites is expected to begin in the above period.

CSO: 5500

NEW SECOND-GENERATION TELEX SYSTEM IN OPERATION

Prague TELEKOMUNIKACE in Slovak No 3, Mar 78 p 32

[Article by Ondrej Siagi, Jan Merica, Okres Communications Administration in Zvolen]

[Text] Further progress in the modernization and improvements of the telegraphic network in Czechoslovakia made it possible to put in operation new teletype exchanges of the second generation system in Prague, Brno, and in Zvolen.

In continuation of the construction of a teletype switching center in Prague, and after good results were obtained in its operation, two additional teletype exchanges were purchased from the firm Nikola Tesla in Zagreb [Yugoslavia] for Brno and Zvolen, the construction of which started in 1976. They are the types ACT K 60 and MMC K 57. It was necessary to prepare the necessary space in Zvolen through adaptation work. This work was done well and within the time limit by the Economic Administration of Communications in Zvolen.

The actual construction of the exchange began in 1977. The work was divided into two stages:

-- installation of the construction, laying of cables, and construction of sources of electric current;

-- tests, construction of switches, and completion of installation work, including the process of putting the equipment in operation.

The actual installation work was handled by the Communications Installation Enterprise in Bratislava, which was assisted by the Communications Installation Works in Banska Bystrica because of manpower shortage. The work was done according to procedures which have been agreed to and under ther supervision of workers of the firm Nikola Tesla in Zagreb. These workers were specialists for construction of the first stage, that is, installation work, and especially for the second stage, which means the process of putting the

exchange in operation as well as supervision during the operational tests.

Cooperation between individual groups of workers was exemplary and helped to keep the time limits of the construction work and to maintain the quality of the work.

By completing the installation work of the Telex network and in Brno in October 1977, the work was completed on connecting teletype stations of subscribers and on connecting circuits for individual teletype exchanges in Czechoslovakia. This work was done in cooperation with the maintenance service of the tone telegraph systems of the Regional Administration of Long-Distance Cables in Zvolen.

A part of the [building of the] teletype exchange was also the construction of its Gentex part in cooperation with the construction of the exchanges in Prague and Brno. The process of connecting collection telegraph stations (ZTGS) and the corresponding connecting circuits took place according to the harmonogram prepared by the International and Long-Distance Telephone and Telegraph Exchange in Prague on 2 to 5 February 1978.

The newly-built teletype exchanges make it possible to transmit telegraph signals at a speed of 50 Bd and data signals at a speed of 200 Bd. The use of cross-switches and other modern elements used in a telegraph communication network guarantees faster connecting and more reliable operations. In addition, the exchanges provide for elasticity in channeling, setting of rates, in the creation of the category of subscribers, and they provide for full accessibility in all respects as well as for the creation of departing routes. The exchanges cooperate with all types of teletype exchanges in Czechoslovakia and provide for cooperation in international teletype communications.

The construction of a facility of the terminal teletype exchange ACT K 60 as well as of the facility of a transit teletype exchange MMC K 57 in Zvolen was determined by taking in consideration the long-range developments of the telegraphic network.

No difficulties occured in putting the exchange in operation, and the subscribers of the Telex network are also fully satisfied with the present operation. In the same way, there appeared no defects in the nature of installation defects. A proof of this was provided by the good results of statistical tests. The quality of the operations of the actual exchange as well as of the connecting circuits and subscribers' connecting lines will be controlled routinely by the IMC workplace for test measurements. This facility concentrates all breakdown signals on control tables and also provides for written recording concerning defects shown on the centralograph.

The construction of this important system was handled by the Central Slovakia Directorate of Communications in Banska Bystrica with effective engineering

activities of the MTTU in Prague, good installation work of the Communications Installation Enterprise in Bratislava, as well as of installation components of the Communications Installation Enterprise in Banska Bystrica and construction groups of the Economic Administration of Communications in Zvolen.

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CSO: 5500

NIPPON ELECTRIC, DOCAS GROUP FORM ELECTRONICS FIRM

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 2 May 78 p 32

/Text/ The Nippon Electric Co. (NEC) and the Docas Group of Santos reached final agreement on the formation of a new company with Brazilian private capital control for the production of SPC (stored-program-controlled) telephone exchanges. With majority capital, Docas will have the right to appoint the president and two other directors of the future CEN -National Electronics Company, the name that has already been chosen for the company that is being organized.

The chairman of the board of NEC do Brasil, Hygino Corsetti, announcing the decision exclusively to O ESTADO, pointed out the "new and revolutionary aspects of the condition of exchange of technology which the country will obtain from the Nippon Electric Co. because the percentage of national capital in the CEN from the outset could be much higher than might be ecpected in the industrial establishment of the new generation of telephone exchanges controlled by computers."

According to the former minister of communications, the conditions already defined for the NEC-Docas joint venture will make it possible to frame industrial production within the real needs of the market both as to quality "without forcing or pressuring the sector through unrealistic expansion of the factories."

But the great advantage pointed out by Corsetti as stemming from Brazilian control of the CEN will be of a technological nature, "In the first place, we will have the guarantee of absorbing one of the most advanced technologies in the world in that sector--which Japanese technology in the SPC area undoubtedly is. In the second place, as a result of the concrete work by the NEC do Brasil we can guarantee really high levels of nationalization at the rate the Brazilian Government stipulated. That way we will be able to offer better prices, according to the competitiveness already shown by the NEC do Brasil.

The Nippon Electric Co of Japan will supply all the basic software for the manufacture of the electronic exchanges by the CEN, and also part of the hardware, especially the more advanced components, Hygino Corsetti explained. "We can advance much more rapidly in that field and prepare the phase of digital exchanges which will necessarily come in the eighties. Engineering is the decisive point for that."

Corsetti declared that the SPC exchanges not only reduce the initial cost of investment--for 100,000 or more terminals--compared to the conventional telephone exchanges of the cross-bar type but they permit much greater savings in the long term with greater reliability and reduced maintenance costs.

After almost 2 years of negotiations with five national groups, the Nippon Electric Co. and the Docas Co. reached final agreement with the NEC becoming the minority partner in the new company "as is already the case in six other countries," Hygino Corsetti pointed out. "As a Brazilian and as a former minister, my major effort has been to fight to see that Japanese participation be the most advantageous possible for Brazil. "Thus," he observed, "NEC has never sent profits or royalities abroad. The Tokyo home office has always covered the possible deficits and supported the investments of its Brazilian affiliate."

Corsetti declared that the NEC do Brasil under his influence and with the "understanding of the Japanese," has full autonomy of decision. That is why he believes that the future CEN "will be able to have greater independence than a simple subidiary, having that experience and a majority share of Brazilian capital." According to the former minister, the NEC do Brasil succeeded in achieving one of the highest level of nationalization of telephone equipment (around 92 percent) in the country, reducing imports and at the same time avoiding the excessive specialization of production. "And we established a department of technological development with the growing and predominant participation of Brazilian engineers. Today we are in cooperative contacts with the University of Sao Paulo (USP) and the Brazilian Telephone Corporation (Telebras) research center."

Old Accusation

"Is it legal for a minister of communications immediately after leaving his post to become the director of a company in that sector, with which the government had contracted to supply about 100,000 telephone terminals?"

Hygino Corsetti, accused in 1975 of having favored the NEC do Brasil during his administration because he assumed the position of chairman of the board immediately afterwards, received the question calmly and replied:

"Before accepting the offer of the position of chairman of the board of NEC do Brasil, I consulted Minister Quandt de Oliveira, Minister Reis Velloso, and even the minister-chief of the National Intelligence Service (SNI), General Joao Baptista Figueiredo, to whom I showed my plans to accelerate the

transfer of technology and rapidly raise the level of nationalization of the equipment of a Japanese company recently arrived in the country. I can guarantee that all the high-ranking authorities with whom I spoke at the time expressed their approval of my plans and did not interpose any objections my heading the NEC do Brasil. Today I reply with concrete facts to the accusations of 1975 and guarantee that the NEC do Brasil has been a company that has conducted itself correctly in all aspects, even accepting conditions that are unusual among multinationsl to accelerate the actual transfer of technology to Brazil.

8711
CSO: 5500

RADIOBROADCASTERS PROTEST QUANDT TV BROADCASTING DECISION

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 30 Apr 78 p 26

/Text/ The owners of radio stations in the interior of the state returned to their cities greatly concerned over Minister Euclides Quandt de Oliveira's confirmation on Friday of the decision opening the way for television stations to install video repeater stations which, according to the radio executives will cause an economic decline among the radio stations in the interior. According to them "the financially more stable business firms will end up by diverting their advertising budgets to television because after all it is something new for their store or industry and even for the city."

That was the great concern of the 99 radio executives who participated in the First Radiobroadcasters Meeting sponsored by the Association of Radio Stations of Sao Paulo (AESP) for 3 days in Aguas de Sao Pedro. In a veiled way the blame fell upon the Brazilian Association of Radio and Television Stations because, according to the minister himself, the organization was consulted before the decree was drafted and it did not lodge any objection.

Strangely enough, the report of the issuance of President Geisel's decree was transmitted on the same day that the presiding panel of the Aguas de Sao Pedro meeting was preparing a memorandum to the minister of communications requesting the review and reevaluation of the paragraphs of a directive issued in 1975, authorizing the operation of repeaters. Since the regulation of the subject had been finalized, the radio executives on Friday heard only Minister Quandt de Oliveira's covering memo justifying the measure.

But the charter of principles and objectives of Aguas de Sao Pedro includes studies that may bring benefits to sound radiobroadcasting in Brazil in the future especially in the industrial area. According to the radio executives, the factories of sound equipment do not maintain a uniform system to advertise and to put medium quality equipment on the consumer market; and what is of greater concern, there is successive lack of replacement parts, forcing the radio stations to purchase new equipment. A specific motion on the problem was presented to Minister Quandt de Oliveira requestion the minister's intervention with the industries to see that a piece of equipment put on the

market will subsequently have replacement parts of the same quality and in sufficient quantity to take care of demand.

In the economic-financial sector, the meeting of radio station owners was basically concerned with initiating studies with a view to getting special federal government financing through the Fund for Financing Machinery and Equipment (FINAME) with the extension to 72 months of the term for payment of the debt, including principal, interest and a preestablished monetary correction. At the present time the maximum term of 36 months raises the cost of in installment payment and the monetary correction makes the installments variable. Also the taxes on the equipment will now receive the special attention of the AESP. According to the executives radio equipment has become a vehicle of dissemination and an integral part of the public life of a city and for that reason should deserve a much lower tax than the present one, which is at the rate of 20 to 24 percent." That financing pertains to the purchase of new apparatus on the national market required by the government in order to give the Brazilian radio stations a single standard of service.

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CSO: 5500

COBRA PROPOSES MINICOMPUTER ASSOCIATION TO BLOCK IBM SALES

Rio de Janeiro JORNAL DO BRASIL in Portuguese 29 Apr 78 p 16

/Text/ COBRA the Brazilian Computers and Systems Corporation, yesterday proposed that all four Brazilian companies authorized to manufacture minicomputers in the country join together in order to prevent IBM from putting 400 minicomputer systems on the national market. The proposal was cited yesterday by the director-president of the company, Carlos Augusto Rodrigues, who considers the entry of that multi-national into this segment of the market highly detrimental.

The president of COBRA believes that putting those 400 IBM systems on the market is a serious threat to Brazilian industry and would be equivalent to the annual production of two of those companies authorized to manufacture minicomputers, or 30 percent of the market. "It is important that Brazilian manufacturers be united at this time becuase IBM's intention is creating great uncertainty," he declared.

Within the next few days, there will be a meeting among the four companies involved when a joint statement will be issued protesting against the sale of the IBM minicomputers in the domestic market. The Brazilian companies are going to get together and once again it is the time to seek an association through which we can speak. That association could be the Brazilian Electro-Electronic Industry Association (ABINEE), explained Carlos Augusto.

Next week, COBRA will launch its first product developed with completely national technology: a telecommunications terminal developed by the company together with the Federal Data Processing Service (SERPRO). According to the executive, this terminal is similiar IBM's, with technology as well developed as the multinational's, That is the best answer we can give all those who do not believe in our capability and our work, he declared.

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CSO: 5500

CAPRE PICKS ELEBRA TO BUILD MINICOMPUTER PRINTER

Rio de Janeiro JORNAL DO BRAZIL in Portuguese 1 May 78 p 15

/Text/ Sao Paulo -- The Brazilian Electronics Corporation (ELEBRA), a company with completely national capital (24 million cruzeiros), the largest in the country in the area of telecommunications equipment, was selected by the Electronic Activities Coordination Commission (CAPRE) to produce equipment to interface with the computer systems in Brazil. The item is a serial printer, which will be presented to the minicomputers producers in five different models. The beginning of production is scheduled for next June.

The information was supplied by the president of ELEBRA, Engineer Seily Heumann, who explained that his company's project for the production of accessories is the first presented in the country. The Sao Paulo executive is optimistic about the prospects of the minicomputer market in Brazil which, according to him, is the fifth in potential in the world, and obviously it will also be the fifth in the area of accessories.

Anticipated Production

Mr. Seilly Heumann explained that the company has invested 25 million cruzeiros (10 million in training and 15 million for the production of the mechanical parts) to make possible the production of the printers which will be associated with the minicomputers to be put on the market the second half of this year.

"Our anticipated production in 5 years is 7,000 printers. About 1,500 per year; 600 this year and then we will have gradual increases." With regard to the percentage of nationalization of the equipment, the business manager of the company, Mr Edier Santiago Pereira, reported that it will be 50 percent at the beginning, reaching 85 percent in 1980 and 90 percent in 1982. He pointed out further that "our project envisages the addition of 60 employees to our present staff of 490 employees."

The cost of the serial printer will range from 90,000 to 160,000 cruzeiros. It will depend on the model and the options -- 10 -- selected.

8711
CSO: 5500

BRIEFS

NONALINED BROADCASTING RESOLUTION--The group of broadcasting resolution--The group of broadcasting experts of the nonalined states following their session in Algiers approved a resolution in which they stated that they had studied the question of the distribution of the frequency bands in preparation of the world administrative conference of broadcasting and communication. The experts expressed their belief that an important step has been taken in Algiers along the road of achieving the legitimate expectations of the broadcasting organizations of the nonalined countries. Data has been compiled for formulating firm proposals on several questions. The experts warned against the danger of the foreign radio stations whose frequencies extend outside their national borders, underlined their solidarity with the radio stations of the liberation movements and demanded equality in the distribution of the frequency bands with the advanced countries. [Text] [Algiers Domestic Service in Arabic 2200 GMT 16 May 78 LD]

CSO: 4402

BRIEFS

USE OF MICROWAVE LINES--Tehran--Minister of Posts, Telegraphs and Telephone Karim Motamedi, speaking on the occasion of the International Union of Telecommunications yesterday said Iran currently uses 20,000 kilometers of microwave lines on its telecommunications facilities in Tehran and a few provinces. Present facilites will be extended to cover other cities as well over the next 5 years when the entire telecommunication network will be operated under the microwave system declared the minister. He also spoke of the work of the international telecommunication union with a membership of 154 which he said had done a great deal for the development of telecommunications systems throughout the world. Meanwhile, the ministry has issued a 15 rial stamps to commemorate International Telecommunications Union Day and these were placed on sale at all post office counters. [Text] [Teheran TEHRAN JOURNAL in English 18 May 78 p 3]

CSO: 5500

BRIEFS

NEW SATELLITE STATION--President Yhombi-Opango opened the new satellite telecommunications station at (Moungouni), 12 kilometer from Brazzaville, this morning. The station will facilitate telephone, telegraph and TELEX links with several countries through the INTELSTAR system. Links with France, Ivory Coast and Gabon have already been established. The station will also be used for the reception and transmission of television programs. The project was financed chiefly by French aid, which took the form of a 13-year low interest loan of some 1,800 million CFA francs. Congo's initial contribution was 275 million CFA francs. [Brazzaville Domestic Service in French 1215 GMT 28 Apr 78 LD]

CSO: 5500

BRIEFS

NEW RADIO TRANSMITTERS--Chadian National Radiobroadcasting (RNT) will soon have new transmitters that will enable it to provide better radio coverage in the country and to increase the number of hours of national language programs by instituting a second broadcasting schedule. The new equipment will include a 100-kilowatt transmitter supported by another, 20-Kw, transmitter in the event of breakdowns. On the other hand, a third, 20-Kw, transmitter will be provided to cover the N'djamena area. The total cost of this work, which will be carried out by the French Thomson CSF company, comes to Fr 1 billion 200 million CFA [African Financial Community]. This sum was made available through the efforts of the Chadian government itself. [Text] [Brazzaville LA SEMAINE AFRICAINE in French 30 Apr 78 p 10] 7428

CSO: 5500

BRIEFS

AUTOMATIC TELEPHONE SYSTEM--The Republic of Djibouti has just put its new automatic telephone system into service, furnished by CIT-ALCATEL /International Telephone Company-Alsatian Company for Atomic, Telecommunications and Electronic Construction/ in accordance with a contract on the order of 5 million francs. The new telephone network installed by CIT-ALCATEL is of the Crossbar CP 400 type. It has an initial capacity of 4,000 consumers. CIT-ALCATEL also furnished an installation (six positions) making it possible to assure a hookup with international connections of the Republic of Djibouti. /Text/ /Paris ELECTRONIQUE ACTUALITES in French 21 Apr 78 p 8/ 8568

CSO: 5500

BRIEFS

SCHOLARSHIPS TO JAPAN--By Decree No. 352 PRG [Office of the President of the Republic of Guinea] of 4 August 1977, a scholarship for 3 months' study in Japan, within the framework of the telecommunications network with hertzian and multiplex waves, was granted to the following comrades: 1) Abdoulaye Kobele Keita, engineer; 2) Malick Soumah, engineer; 3) Moro Sangare, engineer; 4) Oumar Barry, engineer; 5) Djibril Diallo, engineer; 6) Thierno Saidou Bah, engineer; 7) Abdoul Karim Diallo, assistant engineer; 8) Malado Diallo, assistant engineer; 9) Keoule Pepe, assistant engineer; 10) Oumar Sampou, assistant engineer. The instruction and living expenses as well as those of round-trip transportation are provided by the Japanese partners. [Text] [Conakry JOURNAL OFFICIEL DE LA REPUBLIQUE DE GUINEE in French 15 Sep 77 p 172] 11937

CSO: 5500

NBC DIRECTOR GENERAL REVIEWS BROADCAST PLANS

Kaduna NEW NIGERIAN in English 11 May 78 pp 9, 12

/Excerpts/

THE role of radio as a communication medium cannot be over emphasised. In spite of all its shortcomings the Nigerian Broadcasting Corporation (NBC) occupies a unique position in the country's media of information. When Dr. Christopher Kolade retired as its Director-General last December, it was not clear as to who would succeed him. The speculations ended early in February when the Federal Military Government named Mr. George Bako, as the sixth Director-General of the NBC.

Mr. Bako, 40, is an engineer by profession and was the Deputy Director-General (Technical Services) of NBC before his new appointment.

Youngish looking, Mr. Bako is married with four children and is a thorough-bred professional.

To find out how he is coping with his new appointment, the New Nigerian recently interviewed him. Below are extracts from the interview:—

NNN: Work has been going on in the proposed NBC stations in each state of the federation. What is the total achievement so far and when do you think the projects will be completed?

BAKO: We have seven new states. Lagos State has never had a Lagos State NBC. Maybe because Lagos has a dual role as federal capital and belongs to a state. The government said we should have radio stations in these eight areas. Out of the eight, four are on, which are Yola, Bauchi, Minna, and Lagos State. Owerri will be on soon. So is Makurdi. By the end of the month, all the eight stations will be on. If they are on and we are confident they will, we would have achieved 100 per cent in that wise. In the case of the older states, we have been replacing transmitters there because the transmitters have been for 15 years and even some 17 years. We started off with Ilorin then Ibadan, Benin, Enugu, Sokoto and Kaduna which will be on anytime from now. All we are left to do now is new transmitter for Port Harcourt and Maiduguri. In fact that of Maiduguri was delayed mainly because of a change in site where construction had begun because of the Maiduguri Airport.

NNN: You have been beaming signals to South Africa. I guess you have been monitoring performance. What is the success?

BAKO: It's been quite successful. We have been getting listerners' letters from southern Africa since we started the transmission and some of them say they have been enjoying our programmes. We are happy about it because we designed the aerials ourselves, (NBC). We feel very proud of it because this is the type of thing we would like to see more often. In the technical services division, there is the research and development section which looks into such initiatives.

CSO: 5500

BRIEFS

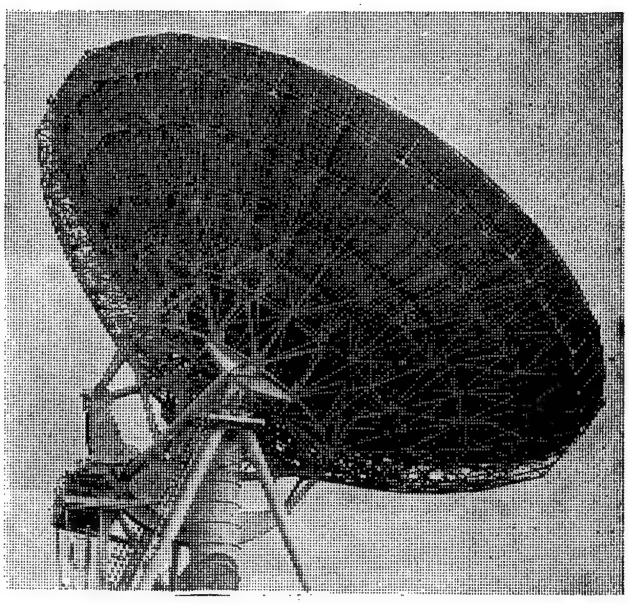
NEW BALLOON COMMUNICATIONS SYSTEM--In a great many countries, they have begun an expansion of telephone, radio and television service thanks to the use of electronic transmitter-receivers held aloft by balloons at altitudes of from 3,000 to 5,000 meters. These kinds of "flying towers" are of particular interest to the countries of Africa, the Middle East and the Far East, where the developed and populated zones are often very far apart. These floating systems, held aloft by balloons, are already in place in Iran, Korea and around Key West in Florida on the southeast coast of the United States. The Federal Republic of Nigeria's minister of communications made a deal estimated at about 150 million dollars with the TCOM Corporation, an affiliate of Westinghouse Electric, for the installation of six balloons, attached together in a cluster with an aerodynamic design giving them great stability. These balloons, called "aerostats," will make it possible to introduce television and FM radio to the greater part of the territory of Nigeria. Moreover, they will provide a high-density, interurban telephone network, linking between them the main local stations, will insure the connection of the local circuits and the stations, will furnish a secondary interurban line insuring communications with the regional capitals, and will make it possible to establish a community telephone service for isolated subscribers and a mobile telephone service covering the entire territory. [Text] [Paris AFRIQUE INDUSTRIE in French 15 Apr 78 p 21] 11937

CSO: 5500

TELECOMMUNICATIONS SATELLITE STATION INAUGURATED

Lome TOGO PRESSE in French 27 Apr 78 pp 3, 4

[Text] President of the Republic Eyadema on 26 April inaugurated Togo's ground station linked to the International Telecommunications Organization communications satellite network. The station, which is built at the site of the receiving station at Cacavelli, is 6 meters high and weighs 400 tons. The antenna itself is 32.5 meters in diameter and weighs 150 tons. The station, which cost 2.355 billion, was constructed by the French company Telspace. It has direct connection with France, FRG, the United States, Gabon and Ivory Coast.



CSO: 5500

BRIEFS

NEWS AGENCY REORGANIZED--Kampala, 3 May (Hsinhua)--Ugandan President Idi Amin has approved the reorganization of the Uganda News Agency, according to a report of the "Voice of Uganda" today. The president appointed Nathan Epenu who has been the editor-in-chief of the "Voice of Uganda", as director of the news agency, Eddy Keronga who has been the controller of the programme of the Uganda television station, as deputy director of the agency, Zulf Khalefan who has been the deputy editor-in-chief of the "Voice of Uganda", as editor-in-chief of the agency. President Amin said that the Uganda News Agency will project not only Uganda's image but also that of the entire African continent and third world. The president also advised the agency to ensure that it always transmits true facts. [Text] [Peking NCNA in English 1611 GMT 3 May 78 OW]

CSO: 5500

USSR FIRST DEPUTY MINISTER OF COMMUNICATIONS TALKS ON RADIO DAY

Moscow Domestic Service in Russian 1015 GMT 6 May 78 LD

[Talk by Vasiliy Aleksandrovich Shamshin, USSR first deputy minister of communications, about 7 May Radio Day]

[Excerpts] Radio-broadcasting, for us, is developing in an integrated manner. Construction work is underway and the capacities of the radio transmission networks of all broadcasting ranges are increasing at the same time as the expansion and increase in programs in the wired radio network. The distinguishing specialty of our system of radio broadcasting is the organic unity of program provision--the serving of the entire country with central and republic programs--and this has demanded the solution of a number of complex technical problems. The mastering of space has opened up new possibilities. In the coming years central radio programs will be transmitted to the most remote corners of the country by these space "bridges" and their quality will be very high.

The wired radio network is the largest in the world. The network of long- and medium-wave broadcasts, which has been developed over decades, is being enlarged by new and powerful transmitters, primarily in Siberia and the Far East; however, this is limited by the accelerated development of wired radio distribution and radio broadcasting on ultra-short waves. This is the basis for local radio broadcasting, which is becoming increasingly popular.

The creation of a widespread network of intercity television channels has allowed for the unification of all the country's television stations into a single network. Every day there are link-ups between large cities in the USSR and also abroad via Intervision and Eurovision. An international system of space links with the socialist countries--via Intersputnik--has been created which also uses the Soviet Molniya communications satellites. In the near future there will be an exchange of programs with Pyongyang and a number of other capitals. The work done for the Olympics will further expand the networks for exchanging TV and radio programs.

The entire TV broadcasting system in the USSR today contains more than 2,000 transmitting stations of varying capacities. All of them are linked

by a network of TV channels, by radio relay, by cable and by space lines of communications extending for hundreds of thousands of kilometers. Already 80 Orbita stations work via the system of Molniya and Raduga satellites. Thanks to this, since the beginning of 1977, provision has been made for multitime zone television broadcasting of the first program of central TV--via Orbita-1, -2, and -3. The zone for receiving the second program of central TV has also been expanded in the north European part of the country, the Urals and Central Asia and for television viewers of Chukotka, Kamchatka, Sakhalin and Magadan Oblast. The Orbita-1 program is transmitted from Moscow with a difference of 8 to 10 hours in relation to Moscow time. For viewers in Krasnoyarsk Kray and further east to the Pacific coast it is Orbita-2 with a difference of 5 to 7 hours in relation to Moscow time. For TV viewers in Western Siberia, Altay and the republics of Central Asia and Kazakhstan it is Orbita-3 with a difference of 2 to 4 hours.

The first central television program is transmitted to all the TV transmitters of the European part of the country and the Urals. More and more towns receive the second central program by land line. Much work has been done recently to provide TV and radio broadcasting to the oil and gas workers of West Siberia. Thousands of kilometers of radio relay lines and stations for space communications and dozens of TV and radio broadcasting stations have been built. Much work has been done for the BAM region. Powerful radio transmitters have been commissioned and a number of areas can receive TV. By 1982, without exception, the inhabitants of this area will be able to receive high quality TV and sound broadcasts.

The development of television and radio networks is being carried out according to a single state plan with the use of standardized equipment supplied mainly by Soviet industry. Party and administrative organs have been of great help in this, especially in Kemerovo, Tyumen and Amur oblasts and in Yakutiya. In 1977 alone the zones of TV broadcasting were significantly expanded in Amur, Novosibirsk, Chita, Tyumen, Sakhalin, and many other oblasts. The 1978 new and powerful TV stations will be commissioned in Krasnodarskiy and Altay krays, in Sakhlin and Kamchatka, Volgograd, Tyumen, Chita and other oblasts. Thanks to the construction of Orbita stations last year the inhabitants of Nizhneangarsk and Severokurilsk received television, as did Novaya Zemlya and Barguzin. This year they will be joined by Nogliki, Arkalyk, Mys Shmidta and other inhabited areas.

While in the past TV transmitters were built in densely populated areas, each serving tens and hundreds of thousands of inhabitants, they are now being built in much more sparsely populated areas, and in this sense the efficiency of each new station is reduced. Thus it became necessary to develop a new space system for TV transmission, with the use of artifical Earth satellites with higher capacity relay apparatus and highly directional antennas aimed at the area to be served. Such a system is the Ekran system, which is to become operational in 1978. Its service zone will constitute some 9 million square kilometers and will cover the territory of central and northern Siberia approximately from the Ob' River in the west to the Lena River in the east.

The ground transmission network of this system will consist of many dispersed transmitters of varying, mainly small, capacity and equipped with relatively simple ground stations for the reception of TV programs from the Ekran satellite. The Ekran satellite itself is practically stationary in relation to the Earth. For experimental purposes over 150 Earth stations of the Ekran system have already been set up. In 1978-1980, the Ministry of Communications Equipment Industry will increase the production of the Ekran system Earth stations in conjunction with TV relays. They will be distributed, as before, by local communications authorities in accordance with a coordinated plan. The development of this network will make it possible to increase the number of central programs simultaneously received in densely populated areas of Siberia, to expand the zone of reliable reception, and to extend it to many newly developing areas.

CSO: 1823

GREENLAND ASKS EXEMPTION FROM INTERNATIONAL TELECOMMUNICATIONS RULES

Copenhagen BERLINGSKE TIDENDE in Danish 20 Apr 78 p 12

[Text] Godthaab.--The Landsråd (assembly) of Greenland will petition all Danish and European radio authorities to give Greenland a provisional exemption from the regulations on private radio transmitters.

The matter of the private transmitters is a textbook example of how insufficient knowledge in Europe of the realities in Greenland can cause difficulties between Denmark and Greenland.

In accordance with a decision of the European Telecommunications Conference, the Postal and Telegraph Service required that all private transmitters in Greenland, including walkie-talkies, meet the European regulations on transmitter strength. Existing transmitters are to be registered, and, if they do not meet the type specifications, impounded.

This has been protested in the Landsråd since 1975, and in the spring session this year three members raised the issue. Both the president and the vice-president had to take part in the lively debate, and now a united assembly is trying to fight its way through.

The European regulations are not suitable for Greenland, and observance of them can bring many people into mortal danger. Some of the examples from the debates:

The kayaker cannot have an antenna sticking up from his vessel. It must lie in the hull of the kayak. He needs a high signal strength when he gets sick.

The shepherd in South Greenland travels through high mountains far from the fixed transmitter at home. He cannot get through with the strength that is commonly used in Nordsjælland.

Almost every single family has a boat or a dinghy and sails in the mountain-rimmed fjords along the 1,000 km coastline. Many people have been saved because after an accident they have been able to give their position on a powerful walkie-talkie.

Safety is the decisive factor. Therefore, the Landsråd supports a proposal to create a public safety network that can be reached even by weak transmitters. But until that is done, the Landsråd says, the situation must not be changed, and the people must be allowed to use the equipment they have.

8815
CSO: 5500

THOMSON-CSF DIVISION CHIEF DETAILS DIVISION'S GOALS

Paris ELECTRONIQUE ACTUALITES in French 21 Apr 78 pp 1, 8

/Report on interview with Mr Loeffler, Thomson-CSF division chief, on division's goals, by D. Levy; date and place not given/

/Text/ In taking over as head of the "Wireless-Beam and Space-Intercommunications" division of Thomson-CSF /Thomson-General Wireless Company/ at the beginning of this year, Mr Loeffler found a healthy situation--a turnover of 620 million francs representing a 45 percent increase over that of the preceding accounting period; 1.45 billion francs of total orders on the books amounting to more than a year and a half of activity; and new products in the development stage--and a few arduous questions to be resolved: bringing the renewal of the wireless-beam catalog to a successful conclusion and making a favorable approach to the industrial era of space intercommunications relative to equipment aboard satellites as well as to small ground stations. In this regard, according to Mr Loeffler, "small business has managed to get along in the space domain; we are entering the industrial era, and it is only under these conditions that we shall carry on space activity."

During the interview he granted us, Mr Loeffler takes great pleasure in presenting the good results incurred in 1977 in Thomson-CSF's "Wireless-Beam and Space-Intercommunications" division, for which he gives credit to his predecessor, Mr Lepeigneux. In fact, last year this division had a turnover of 620 million francs (direct sales), an increase of 45 percent over that of 1976. This expanded business occurred principally through exports, inasmuch as exports represent 55 percent of the 1977 turnover compared with 35 percent of the turnover of the previous accounting period. It must likewise be pointed out that civilian activity (wireless telegraphy for the PTT /Telephone and Postal Services/ and television) also increased in relation to military activity (92 percent of the 1977 turnover compared with 82 percent for 1976).

The 1977 receipt of orders amounts to 570 million francs marking, it seems, a downward trend toward the first few months of 1978. The comparison with 1976 does not appear favorable (1.074 billion francs); yet it should be mentioned that the exceptional order from Zaire (350 million francs) was included in that year's business. The 1975 accounting period can be considered a better basis for comparison (475 million francs). Substantial foreign orders

were given by Argentina (world soccer champions), Libya, the USSR, Egypt and several other African countries.

Regarding the domestic market, PTT orders increase 23 percent compared with 1976, and this increase, which has been going on for some years (PTT orders have tripled in 4 years), will still continue in 1978 (the ceiling year, it seems), for PTT wants to balance its wireless-beam and cable sector, a sector which is presently experiencing a deficit in the wireless-beam area (35 percent compared with 65 percent for cables). Balance could be achieved somewhere around 1980 to 1982. In addition, let us note that the distribution of civilian-military orders (80 percent to 20 percent) will begin to undergo changes this year in favor of the military in view of wireless-beam orders anticipated for RITA /Integrated Communications Network of the Army/, a network used by the land forces.

New Wireless Beams

The "Wireless-Beam and Space-Intercommunications" division's backlog of orders was established on 31 December 1977 at 1.45 billion francs (1.15 billion francs of direct orders and 300 million francs of internal Thomson-CSF orders), which assures the division more than a year and a half of activity. But the future is already being prepared through the development of new products. Stress is especially being placed on numerical systems, which are experiencing strong growth, particularly in low and middle-of-the-range frequencies. At the present time, the requirements are divided in the proportion of two-thirds for analog wireless beams and one-third for numerical beams; but Mr Loeffler believes that this ratio will reverse itself from 1980 on particularly due to the fact that there is a tendency toward time-sharing, which calls for numerical-transmission systems.

For that reason Thomson-CSF, through a PTT engineering contract and jointly with SAT /Telecommunications Corporation/, is developing an 11 GHz numerical wireless beam with 140 million bits (that is, 1,920 tracks) intended for high-capacity channels and expected gradually to take up the slack of numerical beams. For this equipment SAT is working out the numerical part (demodulating, regenerative frequency) of local oscillators and surveillance with commutation arrangement and capability of automatic-phase operation. It should be mentioned that Koweit is inviting bids for this type of beam.

Again, under contract with PTT and in conjunction with SAT, Thomson-CSF is perfecting a renewal of "Pharaon" 13 GHz wireless beams with 34 million bits (480 tracks), 52 million bits (720 tracks, compatible with the present system) and 2 times 34 million bits (960 tracks) intended for urban and regional connections.

Lastly, to replace its present FH 665 generation covering the capacities of 300 to 1,260 tracks, Thomson-CSF has launched a new family of very modular wireless beams, of low consumption, using a modern technology (microelectronic

hyperfrequency, transistors using a GaAs [gallium-arsenide] effective field in the DMH department of group...) and well-adapted to difficult development conditions. "Thus, Thomson-CSF will have entirely and gradually renewed its catalog during the next few years," Mr Loeffler told us.

"The importance of low-consumption systems with reduced maintenance is, in fact, influencing manufacturers to view their wireless beams in an entirely new light. However, and even though the telecommunications market in the world is strongly expanding, competition will be keen among various competitors on the foreign markets," Mr Loeffler believes, for, he says, "the prices of materials for the new generation are going to drop substantially; therefore, it will be necessary for greater production to compensate for the drop in price."

100 Million Francs for Ground Stations This Year

In the space field Mr Loeffler believes that his division will benefit from the setbacks of the European ECS [Command and Service Squadron] and Marots telecommunications-satellite programs, for which he would like to carry the load along with the H-SAT heavy direct-television satellite. He also hopes to participate in the national projects, known as "SPOT," and their military offshoots. Discussions are under way with the individuals responsible for these programs.

8568
CSO: 5500

NOW WITH ONLY SHORTWAVE RADIO, SVALBARD TO GET SATELLITE TIE

Oslo AFTENPOSTEN in Norwegian 26 Apr 78 p 3

[Article by Einar Solvoll]

[Text] Test transmissions over the past year and a half have given such positive results that by this summer Svalbard can be connected directly to the mainland by satellite, AFTENPOSTEN has been informed by Bjørn Ulvang, telegraph director of Svalbard Radio. Currently telephone service to Svalbard is completely broken off and connections via shortwave are so poor that at times it is almost impossible to hear one another.

Direct TV transmission via satellite will require about 100 telephone channels and will cost a few million kroner extra per annum, chief engineer Solbakken says.

Since the summer of 1974 experiments have been going on for satellite connections with Svalbard, and the results thus far have been encouraging. This indicates that it should be entirely possible to transmit both telephone and telex to Svalbard for a relatively reasonable price, according to chief engineer Solbakken.

Where are the satellites that are supposed to do this in the future?

We will make connections through a satellite that goes over the Atlantic. Some of the test transmissions were carried out via a satellite approximately over the equator due south of London or at 1° West Longitude, said chief engineer Solbakken.

In addition, there may be a delay of several hours in making a telephone call to the mainland. With two new channels via satellite, the sound quality will be greatly improved, about as good as in local calls on the mainland, Ulvang says.

Chief engineer Kåre Solbakken of the Telecommunications Directorate told AFTENPOSTEN that there are plans to start with two satellite channels for telephone this summer, and that telex connections will go by satellite instead of shortwave, as they do today, some time this fall.

"But the big change will come in 1981, when according to plans Longyearbyen will get an automatic exchange with long-distance dialing to the mainland via 24 satellite channels," says chief engineer Solbakken.

"Today connections with the mainland use two shortwave channels of varying quality. As early as this summer two satellite channels using a temporary station will make traffic capacity and sound quality a little better, but from 1 January 1980 it is planned to establish a large permanent station and lease seven or eight high-quality channels, which will mean a great improvement in telephone and telex traffic," chief engineer Solbakken said.

"Will radio listening conditions on Svalbard get better with satellite transmission?"

"It will be possible as early as this summer to send radio programs from NRK over an ordinary satellite channel, and the sound quality may then become much better."

"Today people in Svalbard see 14-day-old TV programs flown in by video tape. Will it be possible to use the satellite for direct transmission of TV programs to Svalbard?"

"That is possible, but it is first and foremost an economic question."

8815
CSO: 5500

TELECOMMUNICATIONS ADMINISTRATION OUTLINES STANDARDIZATION PLANS

Oslo TELEKTRONIKK in Norwegian No 2, 1977 pp 205-210

[Department Head Nils Jonsson: "Standardization of Automatic Systems in Norway"]

[Text] 1. Introduction

Paragraph 1 in "Instruction for the Telecommunications Administration" established by Royal Decree of 20 December 1968 says:

"The goal of the Telecommunications Administration is to make sure the country's requirements for telecommunications will be covered in the most rational and economic way in accordance with the guidelines established by Parliament, the King, and the Department."

What I want to bring up at this time is the requirement about operating the Telecommunications Administration in "the most rational and economic way." This is--roughly speaking--a simple and sensible guideline for the activity. However, in practice there are many things to take into consideration, and a great deal of judgment must be exercised when the course is to be established.

Important guidelines are being set by the political authorities, which naturally enough will not consider the Telecommunications Administration as being isolated. Instead they see it in connection with the environment and the society it must serve.

The Telecommunications Administration does not only provide services. The department also consumes a great deal of materiel and services and therefore constitutes an industrial-political unit of considerable size. One must expect that the political authorities will also be interested in this side of the activity in the Telecommunications Administration.

I mention this in the introduction so that we must clearly realize that the Telecommunications Administration's freedom to operate within the framework of the appropriations may be limited in various ways.

2. Standardization of Automatic Equipment, General

Standardization, which is the subject of my contribution today, is one of the measures which can contribute to a rational and economic operation of the Telecommunications Administration. The need for establishing standard solutions has become more and more urgent as the telecommunications network has grown in size and complexity.

The purpose of standardization is not only to get more inexpensive equipment. The general quality improvement, which should be possible to achieve over the long range both in production and in operation by exercising restraint with regard to variations in equipment, is probably just as significant.

Unfortunately, standardization also involves a conservation effect, which may be a disadvantage. One may keep obsolete technology too long.

There are actually two forms of standardization:

---Standardization of the building bricks, the modules, within the individual automatic system and the individual automatic center.

--The standardization of a small number of automatic systems for use in the telecommunications grid.

The first-mentioned form of standardization, which might better be designated as variant limitation, is a continuous process for the entire life of the automatic system. Strictly followed, it may be felt as a brake on the updating which new services and functions and new components require. There must always be a balance between standardization and modernization, a balance which may often be difficult both for the producer and for the Telecommunications Administration.

The other form of standardization, the choice of a standard automatic system, is probably the form one normally thinks of when one talks about standardizing automatic systems in a country's grid, and it is also the form of standardization I will discuss here.

I will not get much involved in concrete conclusions with regard to the selection of equipment, but I will mainly discuss assumptions and guidelines in the choice of automatic systems for the Norwegian telecommunications network.

One important condition for a sensible selection of standard automatic systems is that one must have established what services are to be required from the equipment. The requirements must be specified and given in the form of a set of well-defined services and functions, capacity and quality standards, standards which the equipment must satisfy.

In some cases it may also be advisable to specify a standard for how a service or a function is to be realized in the equipment, for instance whether it will take place in software or hardware, centralized or decentralized.

The more precise and farsighted one can be when the requirements are established, the less will one have to depend on building in excess flexibility in the equipment in order to be able to handle unanticipated tasks, and the simpler and less expensive should the equipment become. It is therefore important to do thorough work in the part of the standardization process represented by the specification of requirements.

3. Existing Telecommunications Network

If we now consider the existing telecommunications network, we find that this network includes automatic systems with rotating, machine-operated selectors, which had their golden days in the 1920's and 1930's, besides coordinate selector systems from the 1950's and 1960's. The first telephone exchanges using processor-controlled systems from the 1970's have come into operation and more are on order, and we have also ordered telephone exchanges of the modern semielectronic type equipped with wired logic. This selection represents a wide technical range, and we must expect additional expansion of this range when digital telephone exchanges are placed in operation before, for instance, AGF and 7D are out of the network.

Table 1 shows a survey of the amount of equipment and the age distribution for the automatic telephone exchanges (the subscriber telephone exchanges) in our telephone network at the time planned for full automation (approximately 1981/82).

The telephone exchanges are subdivided into four main groups:

--Older systems with machine-operated selectors, relay telephone exchanges.

--Coordinate selector telephone exchanges.

--Semielectronic systems with wired logic.

--Processor-controlled systems.

Each main group is again broken down into types and models.

In the same main group and year, one can sometimes find several types of telephone exchanges and variations which cover roughly the same field of application.

If Table 1 is read carefully, one can detect a tendency toward a concentration of a smaller number of types of telephone exchanges in recent years, but the acquisition of new systems and new variations of systems is still too large as compared to the retirement from a standardization point of view.

Table 2 shows a similar survey for transit telephone exchanges (long distance telephone exchanges). The transit telephone exchanges are all of a more recent date and include a smaller number of types.

The fact that we have so many different types of telephone exchanges in the network is, in my opinion, to a great extent caused by our history and is more a consequence of the supplier situation in Norway than a consequence of excessive optimizing ("tailor's sewing") for the individual field of application.

4. Growth of the Telecommunications Network

Figure 1 shows an attempt at sketching a possible development of the telecommunications network up to the year 2000. Predicted numbers for the total number of installed automatic numbers have been compared with curves for telephone exchange equipment of existing types. The curves from the existing types of telephone exchanges up to approximately 1985 represent the volume involved in existing plans and work hypotheses. The further development should be considered more as an example than as an expression of an accepted plan.

The most interesting part is region A, which represents unsatisfied demand. To satisfy this demand we have types of equipment available which already exist in the network (i.e., we can expand one or more of the areas B, C, and D), but new types of equipment may also become of interest.

The size of area A and the trend of the curves gives an indication of the outer limits for our possibilities for controlling the selection of equipment. In practice we will have to work within tighter limits.

We see from Figure 1 that area A is growing rapidly. Already in 1995, i.e. in barely 20 years, it will constitute one-half of the total capacity.

Another important relationship not expressed in Figure 1 is that it takes a long time from when an administrative decision is made until its effect can be registered fully in the network.

5. Criteria for the Selection of Automatic Equipment

The demands on the telephone network's services are heavier than during the time before long-distance dialing was introduced, and one must expect a continued increase in requirements in the future. This causes new automatic systems to require more resources than previously. It is generally considered that in a modern, processor-controlled system, calculated to meet the requirement for the present time and for the near future, the hardware alone corresponds to the complete "old-fashioned" automatic system with regard to the development, while the software, which requires most of the work, comes in addition.

Table 1. Number of Installed Automatic Numbers on 1 January 1982, Broken Down Into Types of Equipment and Age

Type	Placed in operation										Total on 1 Jan 82
	1931-40	1941-45	1946-50	1951-55	1956-60	1961-65	1966-70	1971-75	1976-80	1981	
7A2	1,200	3,000	3,400	9,800		400	200				18,000
7D	11,100	1,500	5,800	20,000	21,400	22,900	33,200	7,100			123,000
AGF	21,000	3,500	18,500	33,500	22,500	19,000	42,500	24,500	16,000	2,000	203,000
FS					1,500	5,000	6,000	2,500			15,000
8A					10,000						10,000
8B					4,800	45,200	67,800	139,200	51,000	12,000	320,000
ARF						10,400	19,300	38,500	128,100	49,000	245,300
ARK						7,200	37,100	81,200	178,200	45,000	348,700
11B									55,000	10,000	65,000
AKK									17,000	1,000	18,000
10C								8,000	81,000	30,000	119,000
Total	33,300	8,000	27,700	63,300	60,200	110,100	206,100	301,000	536,300	139,000	1,485,000
Total for older systems											359,000
Total for coordinate selector telephone exchanges											924,000
Total for semielectronic systems with wired logic											83,000
Total for processor-controlled systems											119,000

Because of the rapid technical development, especially in the field of electronics, it is expected that semi- and fully electronic automatic systems of more modern types will have a shorter economic life than the electromechanical systems from the 1920's and 1930's. (In order to avoid misunderstandings I must here add that "life," in this connection, is the time the equipment is being produced and sold for new installations, not the considerably longer time when it is operational in the telecommunications network.)

Table 2. Installed Line Capacity in Transit Telephone Exchanges on 1 January 1982 Broken Down Into Types of Equipment and Age

	Placed in operation					Capacity on
Type	1960-64	1965-69	1970-74	1975-79	1980-81	1 Jan 1982
8B		6,400	9,500	8,400		24,300
ARM 503	2,200	5,900	8,460	14,400	23,200	54,160
ARM 201	1,600	6,600	4,600	38,700	6,800	58,300
AKE 13				15,600	12,000	27,600
Total	3,800	18,900	22,560	77,100	42,000	164,360

It is evident that the Norwegian market is too small to give an economic basis for the development and efficient production of a complete automatic system of a modern type. A larger sales volume is required to get a reasonable depreciation of the development costs for a new system. However, for subsystems, especially with regard to the very small telephone exchange units where special requirements exist, even a smaller market such as the Norwegian market may give a sufficient basis for development and production. ("Subsystems" here refer to add-ons or complete automatic systems which are also delivered in a standard model for a larger market.)

One consequence of this is that the Telecommunications Administration should demand from a supplier of complete automatic systems that he must be supported by a larger company and that the goods which are offered must in the main features also be the company's standard product for markets other than the Norwegian market.

After full automatization has been realized, the procurement program will include replacements and expansions. For expansions where the same type of equipment will still be used, there is no possibility for a choice. However, it is conceivable that expansions may be carried out with equipment of another type, possibly combined with rearrangement of existing equipment. This could become of interest especially as a stage in standardization measurements when new technology is available.

In such cases one would have more freedom in selection of equipment--and thus also supplier. One would have the same degree of freedom for replacement by areas.

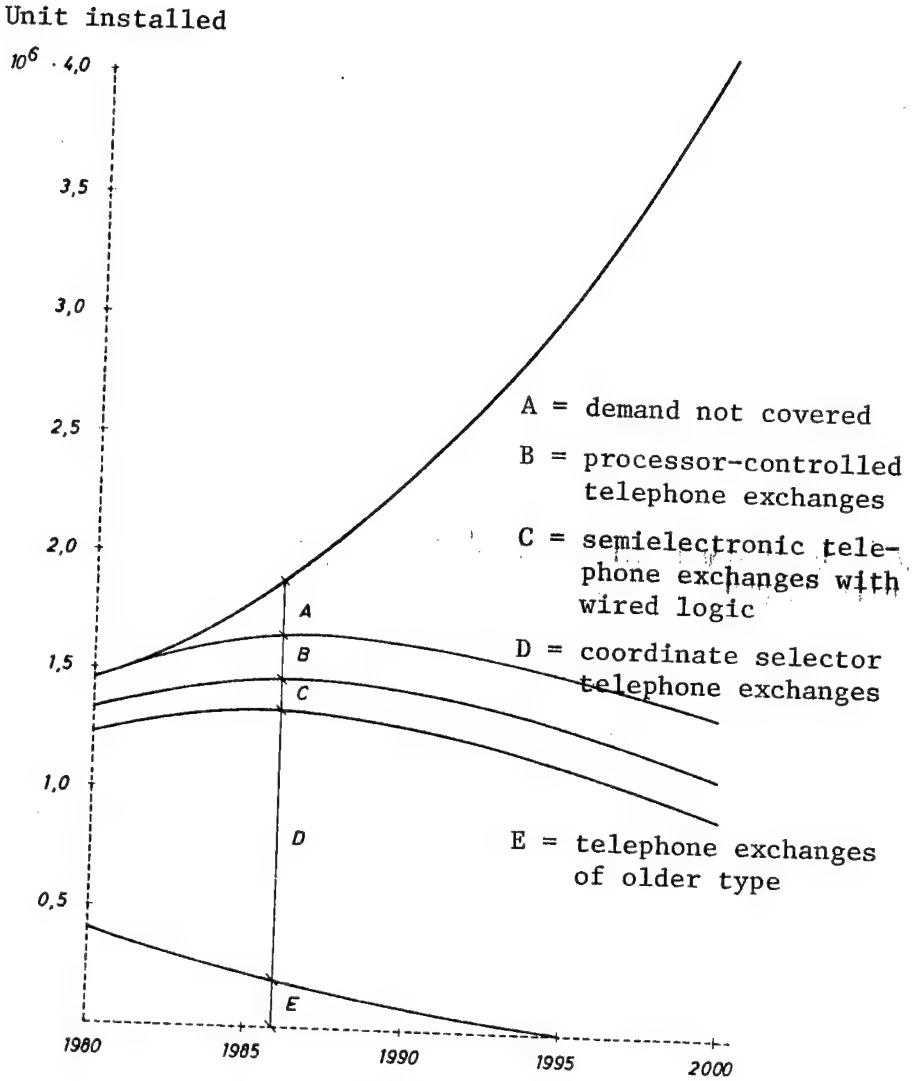


Figure 1

There are generally many factors involved in determining which system and which supplier should be selected for specific projects.

One group of such factors can be classified under "Requirements for functions":

--Traffic

--Services

--Expansion possibilities

--Adaptation to existing network

--Quality of operation

Another group can be classified under "Price":

--Purchase price

--Expected price development

--Delivery conditions

--Guarantees

--Introduction costs

--Operating expenses

A third group may be requirements which pertain to the suppliers:

--Competence

--Production capacity

--Manufacturing site

--Company support

A fourth group may pertain to conditions in the Telecommunications Administration:

--Availability of personnel

--Level of competence

--Training possibility

Factors of this type can normally lead to clear conclusions for the project involved when it is considered in isolation.

The technical status is an important factor in the evaluation of market offers. It is desirable to have a technology which has stabilized without being obsolete. A technique based on a technical new acquisition in an early stage may involve the risk of winding up on a dead-end street.

The procurement of automatic equipment cannot be evaluated only on the basis of the immediate advantages for individual purchases. This is especially true when standardization is being considered. An automatic system has a long life, and one is therefore severely restricted both by the existing equipment and the new equipment one is purchasing. It is therefore necessary to work over a relatively long range. Both in the selection of systems and suppliers one must have clarified and accepted the effects the selection will have not only with regard to the new equipment but also with regard to the existing equipment which one must continue

to live with. What may seem to be the best choice for an individual project may be unacceptable seen in this wider context.

The Telecommunications Administration may also be given other restraints. As I indicated in the introduction, one cannot completely disregard the fact that the political authorities may want to see, in a wider context, possible decisions by the Telecommunications Administration which may have important consequences for industry in Norway, and they may on the basis of national economic considerations find it appropriate to give the Telecommunications Administration directives which are contrary to a profitability consideration for the Telecommunications Administration when considered in isolation. In this connection it is an important task for the Telecommunications Administration to provide the political authorities with a basis for decisions which shows the consequences of alternate choices.

6. Requirements on the Telecommunications Administration as a Buyer

The Telecommunications Administration has a good basis for standardizing equipment when a specification has been presented which contains clearly defined requirements for the operation of the equipment and when criteria have been set up for the selection of equipment and suppliers. This is still not sufficient to guarantee a correct choice. As a buyer one must also be able to evaluate the market offer both in view of technology and price. In other words, demands are being placed not only on the supplier's but also on the buyer's professional competence. For the buyer to acquire this competence requires an investment both in studies of a general, basic nature and in further research on possible systems of interest. Of course, a selection assumes that there are several alternatives, which all must be studied more or less thoroughly before one of them can be selected. An investment in developing the necessary competence for an evaluation is an essential requirement in order to be able to guarantee a correct choice.

One cannot expect to find a new automatic system on the market which immediately coincides completely with one's own specifications. The Telecommunications Administration must therefore expect to adapt their requirements or they must discuss proposals for system changes with the supplier. Usually both of these will be of interest.

When system changes are to be made, it is important that one does not create a Norwegian local variation but that the changes be accepted as a system standard. If the Telecommunications Administration is to achieve such a penetration for their change proposals, it is not sufficient to provide the purchasing power, but one must also provide convincing expertise in discussions with the supplier's experts. Of course, this applies especially when one has come so far in the development phase that the system concept has started to set.

The incompetent buyer cannot expect to make a good trade. However, this is not the only reason why I have come up with good professional competence in the Telecommunications Administration as a requirement for a sensible

choice of a standard automatic system. Also, it is not very inspiring for a supplier to work with a customer who does not match his level professionally. In order to produce his best, the supplier requires the challenge represented by having a customer which on a professional basis is both good at setting requirements and difficult to satisfy. A ciritical, but constructive attitude from the Telecommunications Administration's side, based on good professional competence, is thus important to achieve the best results from the cooperation with the individual supplier.

7. Carrying Out the Standardization

The ideal solution from a standardization point of view would be to have one single complete automatic system which with a few telephone exchange variations would cover our requirement in all consumer fields. If such a system has now been found and a systems standard has been established, carrying out a complete standardization of the automatic telephone exchanges in our telecommunications network would be such a big and long-range task that it could not be done during the life of the system. We must therefore always work with several system generations in the network at the same time. It is therefore even more important to keep the number of types within each system generation low.

In the normal, continuous development of the telecommunications network it is in most cases of interest to build further on already existing automatic telephone exchanges. It must therefore be possible to fit the new equipment into the network besides what is to be retained of older equipment. Only in a few cases, as for automatization and for replacement of automatic equipment by areas, one will have considerable freedom to choose systems without having to take into consideration existing older equipment in the area. It is therefore normal for the transition from old to new equipment to take place gradually.

As far as that goes, the working together of new and old equipment may take place at any of the various levels in the network hierarchy, but it is normally simplest to group new and old equipment separately in traffic-related central groups and direct the traffic between the groups via transit points in a higher part of the network hierarchy. This is especially true when the difference in the applied technology is too great. This procedure usually requires that the existing equipment be relocated simultaneously with the introduction of new telephone exchanges of standard type.

The way our automatic network has been built up with regard to structure and types of telephone exchanges, carrying out a standardization of equipment even within a limited geographic area would have to take place over a longer period of time and with considerable relocation of existing equipment on the way. One must therefore work according to long-range plans, and one may find that steps in the process may cost a great deal as compared to the immediate effect which can be obtained.

While the new automatic equipment is introduced in the network, one must make sure that the operating personnel get the necessary training. The same holds for relocation of equipment. In practice one cannot count on being able to move the operating personnel together with the equipment. A plan for a changeover to new equipment as a stage in a standardization must therefore also include the operating personnel.

8. Conclusion

In the above I have tried to discuss some of the many relationships associated with standardization of automatic equipment. I have not found it correct to draw concrete conclusions with regard to the selection of equipment at this time. We are still located early in the standardization process, and many questions remain which we must find answers to before the future pattern can be drawn up.

8958
CSO: 5500

EXPECTED ECONOMIC CONDITIONS FOR SATELLITE BROADCASTING DISCUSSED

Oslo TELEKTRONIKK in Norwegian No 1, 1977 pp 1-6

[Director of Research O. P. Hakonsen: "Expected Economic Conditions for Satellite Broadcasting in Norway*"]

[Text] 1. Introduction

In the following, data will be shown on cost conditions for a satellite broadcasting system, which finally will be compared with corresponding cost conditions for a ground UHF network.

So far no design has been done of either a UHF network or a satellite network for broadcasting in Norway. The data which are being presented are therefore associated with a great deal of uncertainty. This is especially true for data for a satellite system. Here the most important system components have not yet been developed to a stage which makes it possible to invest in these components in an operational system. Even though the numbers are based on a good knowledge of today's situation and the expected development in this field, they must therefore only be considered to be examples of data--for supporting a discussion of the more basic conditions associated with satellite broadcasting.

For the sake of order it should also be specified that in NRK's [Norway's Broadcasting Corporation] long-range plans, which go as far as until 1985, no resources have been allocated for a new program channel for television.

2. Cost of the Satellite Systems

2.1 Cost Data for the System Components

In order to get an impression of the cost conditions in a satellite broadcasting system, we will in the following assume that such a system will be built in Norway starting in 1985.

*The following three articles are reproduced from lectures given in connection with "The Electric Days 76," 8-10 November at Park Hotel, Sandefjord.

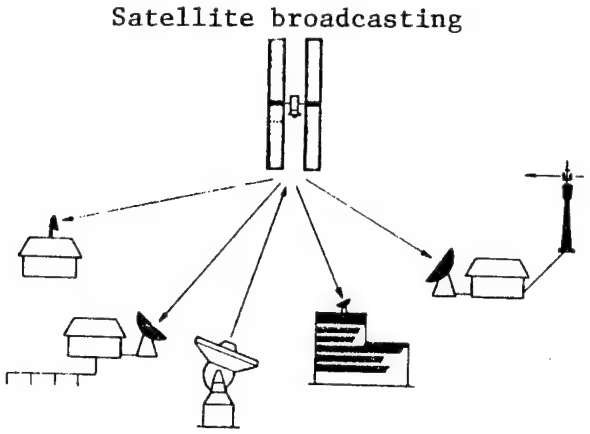


Figure 1

The system is shown in Figure 1, and fully developed it consists of:

--The space segment, consisting of

...Two satellites in orbit, one of which is a backup

...One backup satellite on the ground.

--One transmitter ground station, which transmits the programs up to the satellite.

--800 converters, for covering the shadow areas.

--A large number of joint antenna installations and adapters for individual receivers.

The following assumptions are associated with the individual components in this system:

--The Space Segment
is assumed to have the configuration of a so-called 2 + 1 pattern, i.e. two satellites in orbit, one of which as a backup--and one satellite as a backup on the ground. If the main satellite fails, the backup satellite takes over immediately and a new satellite is prepared for launching. This gives a system with high reliability at the same time as it provides a possibility for utilizing the backup satellite in orbit for servicing telecommunications traffic with lower priority.

Here it is assumed that each satellite has the capacity for four television channels and that it costs 100 million kroner. In addition come launching costs, which have here been set at 88 million kroner for each satellite launched. The launching costs are expected to be reduced dramatically in the future by use of the "space shuttle," but this saving has not been included here.

Costs for control and administration of a satellite in orbit and during launching are estimated at 4 million kroner.

In order to simplify the processing of life duration and time of launching for new satellites, we here assume that each satellite has an economic life of 6 years, which may be considered typical for the anticipated technical situation.

--The ground transmitter station
has an antenna with a diameter of 5 to 10 meters and is assumed to cost 10 million kroner. The economic life is estimated at 20 years and annual operation, without set-asides for renewal, are estimated at 0.6 million kroner.

--Converters
are placed in the terrain in such a way that they can receive the signals directly from the satellite and send these signals out on another frequency so that they cover areas where viewers cannot receive the signals from the satellite directly.

A converter for a program channel is here assumed to cost 0.23 million kroner. It is also assumed to have an economic life of 20 years and an annual operating cost, without depreciation for renewal, of 0.005 million kroner per year. If the converter is equipped for several program channels, this is assumed to require an additional investment of 20 percent and an increase in the operating costs of 8 percent per channel.

--Preamplifiers
for individual reception and joint antenna installations are assumed to cost an average of 1,000 kroner per viewer (license). This cost figure is based on results from three European industrial studies financed by the European Space Research Organization, ESA, and on assumptions about how many viewers will be connected to joint antenna installations in Norway in 1985. The preamplifiers are assumed to have a 10-year economic life and an annual operating cost of 5 percent.

2.2 System Costs

Figure 2 shows total investments for a one-channel satellite broadcasting system, including a ground transmitter station, satellites, and converters, as a function of the degree of coverage. The figure shows that 90 percent coverage can be achieved for an investment in the transmitter system of 130 million kroner. In order to achieve almost complete coverage, an additional 185 million kroner will have to be invested for a total of 350 million kroner. The figure also shows the necessary additional investments on the receiver side.

It can be mentioned that we now have almost 95 percent coverage with our ground VHF network.

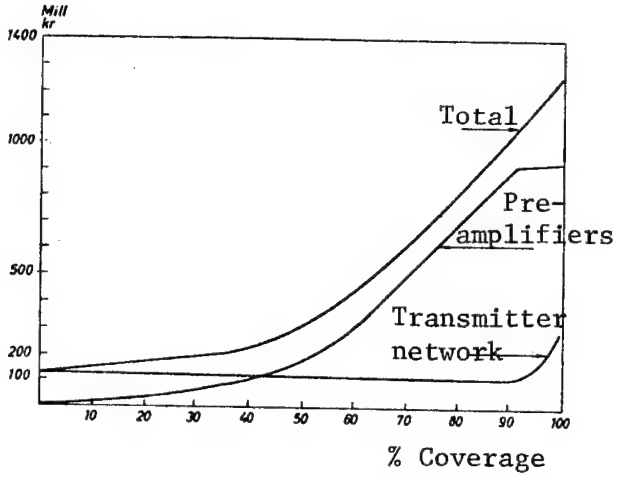


Figure 2. The satellite system: Investment in transmitter network and preamplifiers, one channel

In the following we assume that investment capital is obtained through loans at 12 percent interest but with no repayment of principal. We also assume that depreciation for renewal of each system component is carried out with equal annual amounts throughout the economic life of the entire equipment in such a way that these amounts together with the interest are exactly enough for any necessary new procurement. After the development has been completed, the annual costs for the system will be as shown in Table 1.

Table 1. Costs for a Single-Channel Satellite Broadcasting Station

Interest on borrowed capital	37.6 million kroner
Reserves for renewal of satellites	14.6 million kroner
Reserves for renewal of ground transmitter station	0.1 million kroner
Reserves for renewal of converters	2.6 million kroner
Operation of satellites	2.0 million kroner
Operation of ground station	0.6 million kroner
Operation of converters	4.0 million kroner
Total annual costs	61.5 million kroner

In addition to interest on invested capital, the annual costs for the satellite channels are approximately 24 million kroner.

In these examples interest has been calculated at 12 percent both for investments and for reserves for new procurement.

3. Comparison of Costs for the Two Broadcast Systems, Ground UHF Network and Satellite-Carried SHF Network

Somewhat simplified it may be said that a ground broadcast system costs the same for each square kilometer covered regardless of how many viewers are located in the area.

For a satellite broadcasting system the situation is different because a predominant part of the total costs lies in the extra equipment the viewers must buy so that the total costs increase with the number of viewers in the area.

The relationship can be illustrated in simplified form as shown in Figure 3. For a given geographical area, satellite broadcasting will, according to this, be most favorable economically if the area has a low receiver density, while a ground system is most inexpensive if the receiver density is high.

In view of this, it is expected that Norway within Western Europe--under otherwise equal conditions--will be one of the countries most suitable for satellite broadcasting.

Table 2 shows numbers for investment in the two systems assuming that they must give full coverage in Norway:

Table 2. Investment in Transmitter Networks

	Investment for One Channel	Additional Amount for Extra Channels
Ground UHF network:	1,430 million kroner	430 million kroner
Satellite system	315 million kroner	146 million kroner

These are costs for the transmitter networks alone. Additional investments on the receiver side have not been included here. For one channel the relationship between investment and coverage for the two systems is as shown in Figure 4.

Figure 5 shows the corresponding conditions for three channels. However, the overall economy for the systems is determined by several parameters; the life of the system components, interest on invested capital, and operating costs must also be included.

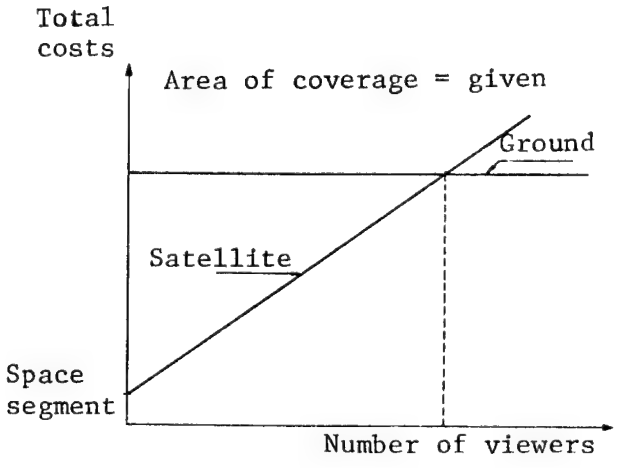


Figure 3. Initial costs for a television channel

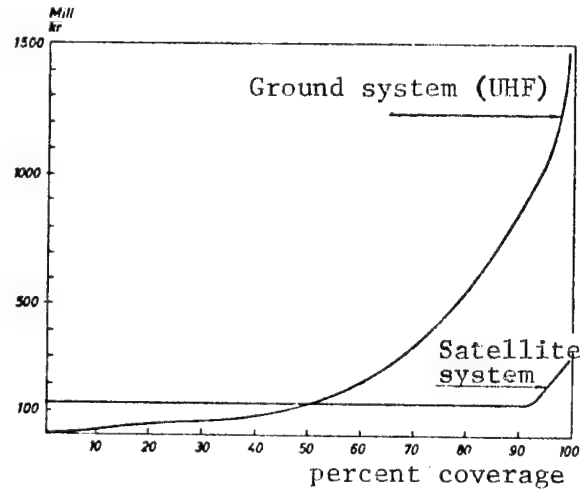


Figure 4. A television channel in Norway. Investment in the transmitter system

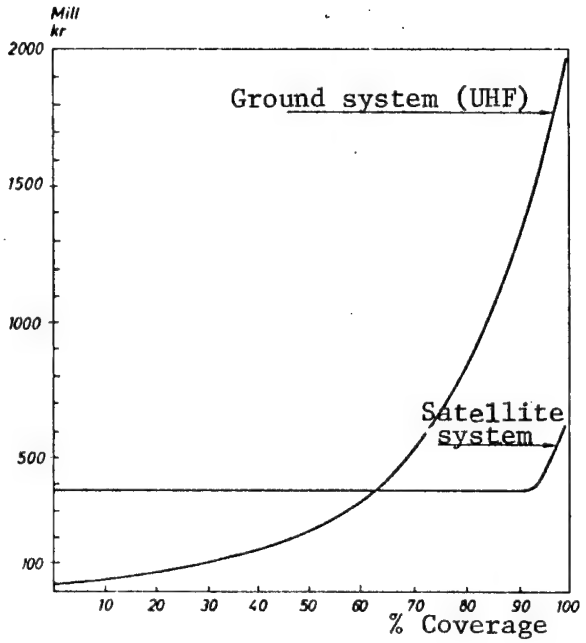


Figure 5. Three television channels in Norway. Investment in transmitter system.

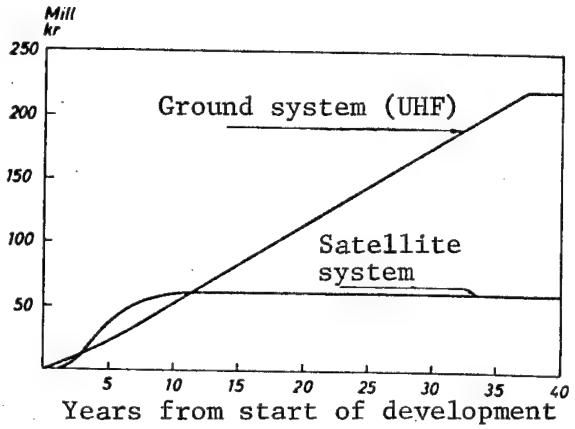


Figure 6. Annual cost = interest + renewal + operation. One channel. 40 million kroner invested annually.

In order to get a more concrete impression of the conditions, we will in the following consider the two systems' economy in connection with two hypothetical development situations.

Example 1: One new program channel is to be developed in Norway for an annual investment in the transmitter network of 40 million kroner.

Figure 6 shows the annual costs in and after the development period, which for the ground system lasts for 36 years, while for the satellite system it can be concluded after approximately 10 years.

In the time after the development has been completed, the annual costs for the ground system are approximately 200 million kroner, or approximately 3.5 times as large as for the satellite system. Here it is assumed that only one-quarter of the satellite costs, including the costs for launching, are charged to the satellite system. As previously mentioned, it is assumed that the satellites have a capacity of four television channels.

Figure 7 shows the costs distributed over the number of viewers which are always covered with satisfactory signals.

Example 2: Norway and three neighbor countries exchange programs so that one program from each country for a total of four programs can be received in all four countries.

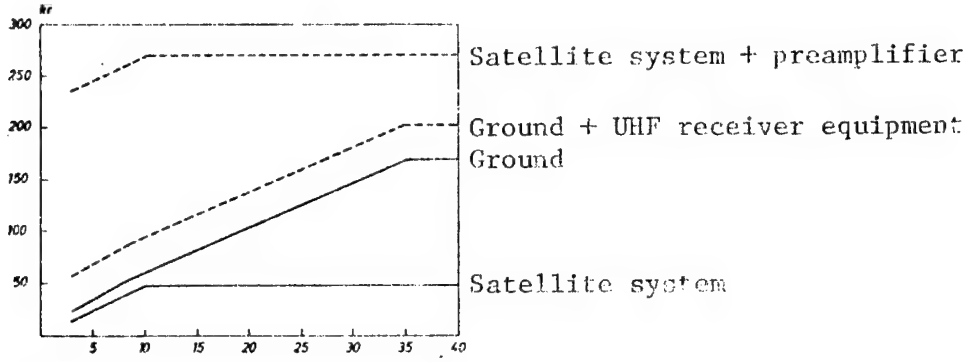


Figure 7. Annual costs per subscriber. One channel.

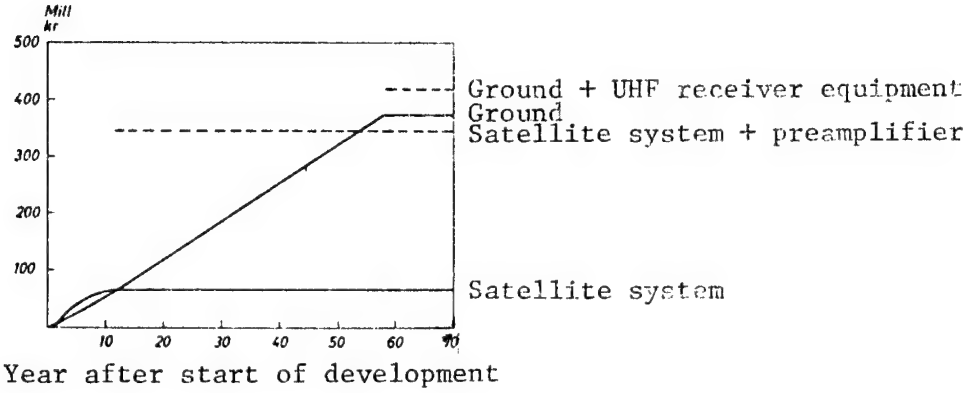


Figure 8. Annual costs = interest + renewal + operation. Nordic program exchange (4x1). Annual investment in the Norwegian sector 40 million kroner.

In this case, three new channels must be developed in Norway in a ground network, while the satellite system is assumed to transmit four channels with an antenna beam which covers all four countries.

It is assumed that the satellites will still have the capacity for four channels and that the four countries will share the satellite costs and investments equally.

Figure 8 shows the total annual costs for Norway during and after the development period if the development takes place with an annual investment of 40 million kroner. The dotted lines show the costs when additional equipment on the receiver side has also been included.

Figure 9 shows the Norwegian part of the investments for the two systems as a function of the degree of coverage in Norway.

Figure 10 shows the investments when the additional equipment the viewers must procure is also taken into consideration.

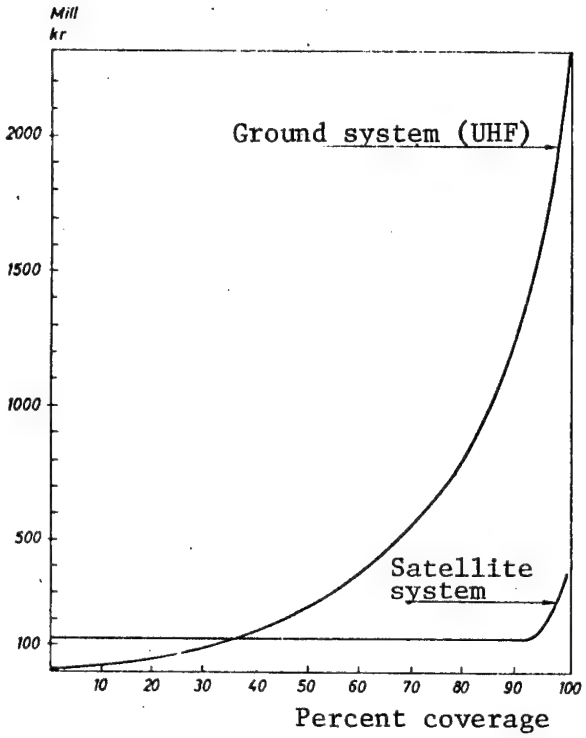


Figure 9. Three channels, Nordic program exchange. Investment in the Norwegian transmitter system.

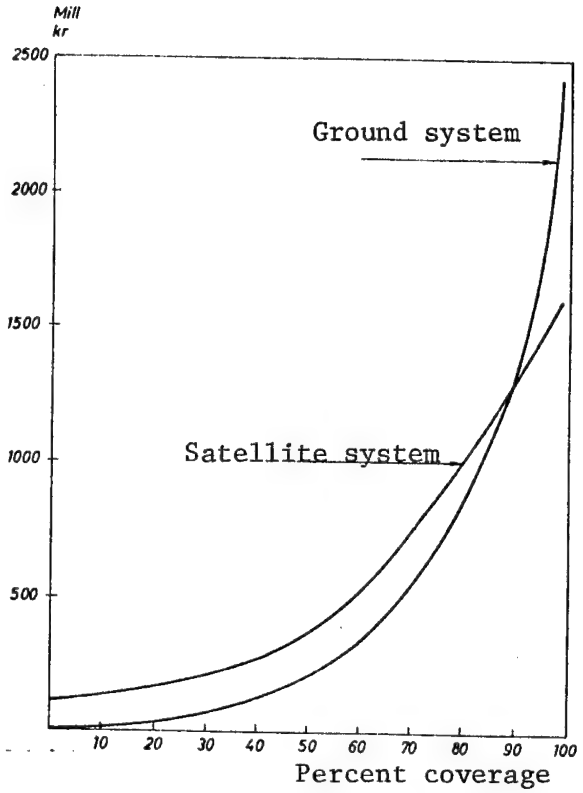


Figure 10. Three channels, Nordic program exchange. Norwegian investments in transmitter systems and preamplifiers.

4. Conclusion

Considerable uncertainty is associated with the foundation and the assumptions for the examples of data shown above.

An interest rate of 12 percent has been used consistently in all calculation examples. An increase in the interest rate will favor investments in equipment with short lifetime--in this case the satellite system, while a lower interest rate will make the ground system more competitive. The examples indicate that:

A. The satellite system sometimes gives a considerably less expensive transmitter system than a ground UHF system, and it gives all parts of the country a high degree of coverage from the start.

   The cost relationship between the two systems is not as clear when the costs on the receiver side are also taken into consideration.

B. The biggest investments in the satellite system lie in the ground segment, extensive preamplifiers, and converters. The economy of the

system is completely dependent upon the assumptions that the unit prices for mass production of preamplifiers will be low.

C. Satellite broadcasting becomes economically more advantageous compared to a ground development the more channels that are being transmitted. A Nordic program exchange seems to be technically and economically well suitable for a satellite system if use of an antenna beam with an overall Nordic coverage is permitted.

The system economy will also to some extent depend upon the possibilities for utilizing the space segment for other telecommunications services too. This is subject to extensive investigations at the Telecommunications Administration's research institute.

The data presented here have been obtained with the cooperation of, among others, Section Manager Veastad, Chief Engineer Theisen, and Chief Engineer Hansen at the Telecommunications Administration Broadcast Office, as well as Engineer Brunvoll from NERA A/S, Division Bergen and researcher Naerland at the Telecommunications Administration research institute.

I thank all of them for the help they have given.

Later calculations at TRK indicate that the cost figures for a ground system will be approximately 40 percent higher than shown in this figure. This does not change the main conclusions, but strengthens the impression about the good economy of the satellite system.

8958
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NEW ERICSSON EXCHANGE IN OSLO BEGINS OPERATION

Oslo TELEKTRONIKK in Norwegian No 3, 1977 pp 222-229

[Project Leader Ole G. Nordbo*: "Oslo's New Long-Distance and Foreign Telephone Exchange AKE 132 (OAKE)"]

[Text] Oslo's new long-distance and foreign telephone exchange of the type AKE 132 has now been in operation for approximately 1 year. It was delivered by A/S Elektrisk Bureau and the L. M. Ericsson Telephone Company jointly. It is a processor-controlled telephone exchange with duplex processors, each with a capacity of 256K words in the data memory and in internal program memory and with a common program memory of 256K words.

The selector network consists of LME's code selector.

The first stage of construction covers 4,800 input and 4,800 output lines. The system fully developed is intended for 30,000 input + 30,000 output lines with up to eight processors working in parallel.

New Requirements

The requirements for automatic telephone systems have increased steadily in recent years. One of the strongest requirements directly associated with the rapid development of telephony is that it must be possible to expand one station during its life to many times its original size while it simultaneously undergoes many functional changes. The system must be able to supply new services, and it must be possible to connect it to a steadily more integrated worldwide telephone network. Especially the long-distance telephone exchanges with their centralized location in the networks have met this requirement for flexibility in connection with the development of long-distance dialing. The increase in traffic for these types of exchanges is exceptionally high, and they are subjected to requirements that they must be able to tie together telephone networks with equipment from various manufacturers and of various ages.

*A/S Elektrisk Bureau

It must be possible to rationalize and improve the operating and maintenance methods so that the steadily larger and more complex telephone networks can be operated with reasonable resources.

The AKE 13 system has been specially developed to meet these requirements both as a national, international, and intercontinental long-distance telephone exchange. By means of stored program control (SPC = stored program control, DMS = data machine controlled) the system has obtained precisely the flexibility required by present and future long-distance telephone exchanges.

Hardware for the Telephone Part

In the telephone part the switching takes place in the selector network. This has been built as a link system with a code selector as the switching unit. The code selector has 10 verticals (bridges), and each of these has 10 inputs and 32 outputs when one has four-wire switching as in AKE 132. The 10 verticals in a selector has its 42 outputs wired in parallel.

O is a chicken symbol which corresponds to one selector input (vertical) where "the beak" points towards the outputs.

The code selectors are connected in series and parallel until one gets a unit with 600 inputs, which is the smallest construction unit in the AKE 132 system. This unit, which is called a 600 group, is used for incoming and outgoing traffic. Oslo AKE has a total of 16 600-groups distributed over eight input (GI) and eight output (GU) 600-groups.

AKE 132 is a long-distance telephone exchange and has therefore no direct subscriber connection. The incoming repeaters (FIR) and the outgoing repeaters (FUR) which process the line signals are each connected to their bridges in in- and outgoing GV steps, respectively. The register signals, either in a MFC national variant, R2 or MFC 8B variant, are processed by code receivers (KM) or code transmitters (KS), which are associated with the B side of the GV step.

In a conventional system, both the FIR and the FUR repeaters are comparatively expensive since the line signals must be detected and accepted by relay circuits within the repeaters. In a computer-controlled system, it should, for instance, be possible to reduce an input repeater to one or at the most a couple of relays which react to the line signals, while signals, interconnection states, and signal interpretation are being detected and stored by the computer.

Matching the Data Part to the Telephone Part

The data part controls the telephone part by means of a continuous information exchange between them. Since they have different time, power and information requirements, a buffer, test and control part (TO part), has been introduced between the data part and the telephone part.

"Writing" in the Telephone Part

A bistable flip-flop in the TO part will react to a pulse (length in μsec) from the computer and turn over. In its new state the flip-flop can supply current to the coil in a reed relay so that the tongue in the reed relay will operate. In this way a telephone relay can be fed with 48 volts. This bistable flip-flop with the reed relay is called an operating point (SMR), and the SMR points are grouped in matrices (ONX) of 16 x 16 each. The address from the computer determines which row and the data word determines which SMR point(s) will operate.

The operating point which in this way get a 1 digit from the data machine will operate their associated relays, while the points which previously have switched and now receive a zero are rejected by their relays.

"Reading" From the Telephone Part

Test points (RT points) are used for signalling from the telephone part to the data part. A signal-receiving relay, for instance in a repeater, has a contact which is connected to a test point in the TO part. When the contact is closed, a plus is sent to the test point, which can thus register that the relay has operated.

The test points are grouped into matrices (TEX) of 72 x 16 such points. Sixteen text points form a test word with a certain address. By sending the address from the processor, the states of all 16 test points are tested simultaneously.

A unit operating independently--the scanner unit--reads the state of the test points and compares the results with information in its memory. The scanner unit is controlled by the computer which provides information on which test words are to be tested and waits for a return report on what changes have taken place or possibly on information that the scanning has been completed.

Software for the Telephone Part

The software for the telephone part distinguishes between traffic control functions and operating and maintenance functions. The following functioning blocks are available for traffic control:

Repeater block, FIR, FUR, or FDR block. The relay unit with the associated program and data forms a functional block.

Register signal blocks. Here too the blocks actually consist of a relay unit (e.g., KM-MFC) and the associated programs and data.

Central blocks. In each switching process in an AKE station, the following central functions are being used:

a) Selection of devices and paths through the selector network. These functions form the SEL block (Selection of devices and paths).

b) Operation of the selectors. The relay unit VMR and program and data for operation form the ORS block (Operation and Release of Switches).

c) Operation of bistable relays. The relay operation takes place through equipment referred to as ODU, and the associated functional block is referred to as ORB (Operation and Release of Bistable Relays).

d) Digit analysis. This is performed by the AND block and consists exclusively of programs and data, namely an analysis program and analysis tables.

e) Coordination of the cooperation between input repeaters, code receivers, code transmitters, and output repeaters during register phase and speech phase. COR-block.

If a signal is to be forwarded from FIR to the FUR side, this takes place through the coordinating block COR. In the same way, digits are being exchanged from KM to KS via COR. COR has no hardware either and consists of program routines for signal processing.

The Data Processing Part APZ 150

The data processing part APZ 150 has been developed especially by L. M. Ericsson for controlling telephone systems and consists, as mentioned, partly of hardware and partly of software (operational system). In addition to the synchronous duplexing, the demand for a high operational reliability has been met by advanced hardware and program functions integrated into the system. Programs and data can easily be changed, for instance in connection with an expansion of the installation.

The computer part Figure 6, consists of 1-8 data processing blocks DPB, each of which contains:

--central processor CP

--internal program memory PSI

--data memory block DSB

--transfer control TCB

--multiplexer MU

The functions of the telephone exchange can readily be assigned to the various DPBs so that each one has

--all functions for the units which each DPB serves (sectioning).

--Variable and fixed telephone exchange data which are associated with the part of the installation which a certain data processing block controls are stored in the associated data memory DSB. The central processors normally work within their own DPB. If a conversation arrangement in an installation with several DPBs affect several installation units, the various DPBs work together in such a way that all central processors can write and read in each other's data memory, DSB and transfer control block TCB. This cooperation takes place through the electronic switching network, which is referred to as a MU multiplexer.

--A common program memory PSC can be reached via the multiplexer.

Reliability Aspects

The reliability requirements for the long-distance telephone exchanges are very strict because of their central location in the network. For the computer in AKE 13 this means that it must be able to carry out its control functions without any or with very small disturbances even if there are errors in hardware or software.

For this reason the central processor, the program memory, the data memory, and the transfer control block in a DPB consist of two units each working in synchronization. This means that as much as half of the data processing part can be taken out of operation without affecting the functions of the installation or its ability to process traffic. If necessary, it is also possible to take one or more DPBs in a multiprocessor installation out of operation, but in this case the traffic capacity of the telephone exchange is reduced correspondingly.

The duplexing also makes it possible to let the station operate with one unit while the other units may be loaded with a new program, for instance.

Thanks to the synchronous duplexing system and systematic monitoring by both hardware and software, a hardware defect caused by a failing component can be discovered quite rapidly and the faulty unit can be isolated. Individual hardware failures do not affect normal operation. Even a number of simultaneous hardware defects may take place without causing disturbances in the operation.

Power Supply

The central power supply installation is of a standard type with rectifier and series converters and batteries for 48V and consists of three parts, part C for the telephone side and parts A and B for each of the duplexed computers. Part C is a backup for both parts A and B. The distribution takes place with individual negative lines (minimum 45 mΩ) from a central distribution point to each individual consumer unit and with all positive lines, wired in parallel, of a larger dimension and connected to a low

resistance ground network (total resistance approximately 0.1 mΩ). A short circuit with a subsequent fuse burnout at one point will not disturb the adjacent rack either in the form of a decreased voltage below the critical level in the time before the fuse has burnt or in the form of voltage peaks caused by the burning of the fuse.

Electronic voltages used, for instance, in the computer part are produced by dc converters. Input-output units are operated on 220V ac produced from inverters driven from the 48V system.

Environment

The various parts in an AKE telephone exchange set somewhat different requirements on their environment. For instance, the same requirements are made on temperature and humidity both for the tape station and for the control room where the personnel will stay. On the other hand, the objectives for the operational reliability of an AKE telephone exchange are so high that considerably tighter limits are recommended for the climate especially in the tape station.

The low levels which the fast circuits in the data processing unit are working on make them sensitive to electrical disturbances, discharges, etc. Semiconducting floors connected to ground are therefore used in these rooms in order to prevent electrostatic discharges caused by the personnel.

Kit

AKE is delivered with 2.9 m high racks, which are assembled at the place of installation and connected to each other and to cross connection racks with station cables, mainly 21 x 2. Each rack contains a number of shelves connected through plugs and jacks. Units, for instance, are built in standard size circuit cards which are plugged into the shelves.

Even though the individual cards have been checked out in the factory, considerable testing of the installation remains to be carried out on site. The data processing unit itself is delivered as complete tested functional units, which reduces the transit time for startup since it is used as a data source in testing the rest of the installation. The normal operating and maintenance programs are also used in addition to special test programs which are only used during the installation.

Construction, Production

A number of repeaters have to be built for adaptation to the Norwegian network. The requirements and the boundary sections have been formulated by the telecommunications administration and EB/LME jointly, while almost all the hardware and software have been prepared by A/S Elektrisk Bureau, partly as a stage in the development of system expertise.

Since the AKE telephone exchange in Oslo is the first delivery of this system in Norway, most of the material has been produced by L. M. Ericsson, but DB has produced approximately 7,000 of the approximately 30,000 circuit cards.

The Telecommunications Administration has ordered AKE 13 for the long-distance telephone exchanges in Drammen, Skien, Bergen, and Stavanger. Here EB will take over a larger and larger part of the production.

8958
CSO: 5500

SKAGERRAK UNDERSEA CABLE IN OPERATION

Oslo TELEKTRONIKK in Norwegian No 3, 1977 pp 304-305

[Text] The above-mentioned sea cable system is owned jointly by the Danish and the Norwegian Telecommunications Administration. In connection with the provisional acceptance of this cable system on 1 October 1977, a press conference was held at Hotel Phoenix in Arendal on 3 October. In addition to representatives from the two telecommunications administrations, representatives from the Japanese suppliers were also present, namely:

--From the trading company C. Itoh and Co, Ltd, the main person responsible for the contract: Ryoohei Kikuno, manager of the department for telecommunications systems.

--Takao Kato, manager of the Oslo office.

--From the cable supplier Ocean Cable Company Ltd: Kenzoo Meguri, administrative director.

--From Fujitsu Ltd, supplier of terminal equipment, amplifiers, and equalizers: Tsunahiko Hashimoto, administrative director for overseas marketing of telecommunications equipment. Shonosuke Issobe, responsible for the project.

--T. Sakashia, director of Nippon Telegraph and Telephone Public Corporation's office in Geneva, also participated. The reason for this was that NTT Public Corporation had been kind enough to perform factory control of the deliveries for the Telecommunications Administration, a task which was carried out in a very satisfactory way.

The Danish delegation was led by Chief Engineer Jens Kiil from the cable engineering service.

When it was accepted, the sea cable system had been under voltage for approximately 1.5 months, and the telecommunications administrations had received measurement journals which showed that all important requirements

in the systems specifications had been met with a good margin. All of these measurements on the systems were carried out under the control of the representatives from the telecommunications administration as usual.

On this occasion the telecommunications directorate information office had sent out the press report which follows later and which also was delivered to representatives of the press at the press conference together with some other background material. After a short orientation from the representative of the telecommunications directorate, Chief Engineer K. W. Olsen showed a series of slides he had made himself of his own and others' pictures, which showed the construction of the sea cable schematically, various stages in the manufacturing of the cable itself as well as the manufacturing of the electronic equipment, reloading the cable in Vigo, Spain, insertion of amplifiers and equalizers, and even placement of the sea cable.

Those present also answered questions from the press, and a fairly lively and interesting exchange of questions and answers developed.

"Norway's largest sea cable for telecommunication, which was laid this summer between Norway and Denmark, was operational on 1 October and will be opened for normal traffic on 1 November this year. The new telephone cable has a capacity of 2,700 telephone channels. The existing three sea cables between Norway and Denmark which are being used today have a total capacity of only 600 telephone channels, and these carry a heavy load. The new telephone cable will therefore improve the telecommunications with Denmark and the rest of Europe and will, according to the forecasts, be sufficient to handle the traffic for 10 years into the future.

"The cable is 144 km long and is produced in Japan. It runs from Arendal via Vrakvika on Hisoy to Hjorring via Tornby on Jylland. The expenses for the cable and the placement were 36.2 million kroner, which are shared between the Telecommunications Administration and the Danish Post and Telegraph Administration, which own the cable jointly.

"The new telephone cable will be able to transmit not only telephone traffic, but also Telex traffic and data traffic. The cable is connected to the new long-distance telephone exchange in Oslo via a radio line. But only when a new radio line communication between Arendal and Oslo and the new tower on Roverkollen in Oslo have been completed according to the plan during the fall of 1978, will it be possible to utilize the entire capacity of the cable to Denmark.

"The part of the cable closest to the Norwegian and Danish coasts were laid by the Danish cable ship 'Peter Faber,' while the main cable was laid by the British cable ship 'Mercury.' The laying of the cable took place without problems, respectively, in June and August this year. The Telecommunications Administration's cable ship 'Telekabel' could not be used since it did not have equipment for laying such large cables. In the sea cable, 34 amplifiers spaced approximately 4 km apart and 5 amplifiers in

the land cable ends have been installed so that the signals will not become weaker on the way. The cable lies at a maximum depth of 665 m. The sea cable is monitored automatically by EDB-controlled measurement equipment.

"The contract partner for the cable is the Japanese trading company C. Itoh & Co, Ltd, Tokyo. The manufacturer of the cable is Ocean Cable Co, Ltd, and the manufacturer of the electronic equipment is Fujitsu Ltd. The cable was shipped to the harbor Vigo in Spain, where the amplifiers were installed, and the cable was then picked up by the British cable ship 'Mercury.'"

Some data for the sea cable system Norway-Denmark No 4

Contract partner: the trading company C. Itoh & Co, Ltd, Tokyo.

Manufacturer: Electronic equipment: Fujitsu Ltd, Tokyo.
Sea and land cable: Ocean Cable Co, Ltd, Tokyo.

Total length:

From the terminal in Arendal to the terminal in Hjorring 144 km, of which the distance Arendal-Vrakvika 6.5 km and the coast end cable Vrakvika--east of Ytre Torungen 4.7 km.

Greatest depth: 665 meters.

Coaxial cable, external dimensions: main cable 57 mm, coast end cable 76 mm, and land cable 48 mm.

Internal diameter of coaxial pipe: 25.4 mm.

Intermediate amplifiers: 34 undersea and five buried on land (two of which are in Norway).

Equalizers: two undersea.

Number of telephone and data channels: 2,700.

Frequency band: Arendal-Hjorring: 3,650 kHz--17,048 kHz. Hjorring-Arendal: 22,752 kHz--37,000 kHz.

Time schedule:

Coast end cable on the Norwegian side laid: 20 June 1977 by the cable ship K/S "Peter Faber"

Main cable laid: 15-16 August 1977 by the cable ship C/S "Mercury"

Electrical tests on the cable: 17 August-1 October.

PAGES 66 & 67

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the Telecommunications Administration. The dispatchers at the coastal radio stations, on the other hand, have for some years now been pointing out that this may happen, and that it could produce far greater consequences than those now being experienced at Farsund Radio," Saetrevik says.

Radio chief Steinar Jensen at Bergen Radio tells AFTENPOSTEN that the radio dispatchers at the coastal stations have not done enough to present their views on the automation and remote control of the radio stations. "None of the dispatchers at the coastal radio station was included in a committee which planned how the stations were to be linked and remote-controlled, we were only allowed to be involved after this had been determined. We have also pointed out several times that fire and technical failures could occur, and that such considerations must weigh heavily when the stations are integrated. These arguments were rejected by the Telecommunications Association," Jensen says.

Speedy Total Destruction

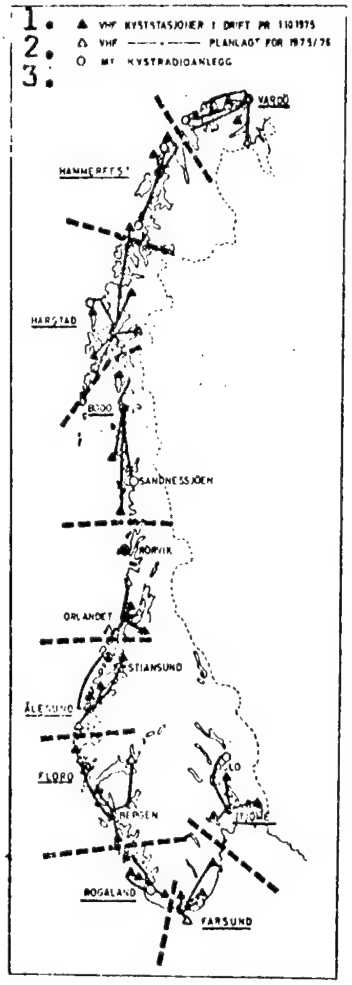
He also maintains that they were lucky in the Farsund fire. "The fire broke out at a quiet time. At Easter there is very little traffic, and at the time the station was out of operation, luckily, no accidents at all happened. And the way in which the fire broke out, too, clearly shows how quickly a station can be totally destroyed. The whole thing happened so rapidly and the entire 'main brain'--the switching center--was put out of operation so fast that the dispatchers at the station had to race to the neighboring house to borrow the telephone and call the fire department. So what we have been pointing out at Bergen Radio all the time is that it would be safer here to have two fixed stations operating in the Vestland area. If the Floro-Bergen is now automated and remote controlled, we could experience similar episodes there. The "main brain" could in that way be suddenly cut out, thus instantly breaking the connection along large areas of the North Sea. If we maintain two stations we would at least protect ourselves against such an accident. Additionally, traffic is now so heavy, due to the constant increase in petroleum activity, that I doubt that a single station in Vestland in addition to Rogaland would be sufficient to service vessels and petroleum drilling platforms in the North Sea in a satisfactory manner," Jensen says.

Could Stop the Fishing Fleet

Radio dispatcher Sven Christensen at Tromso Radio says that the automation and remote control of Tromso Radio would to a large degree affect the safety of the fishing fleet in the area. "We have every bit as heavy traffic as the coastal radio stations to the south. Remote control of Tromso from Harstad would, rather, have catastrophic consequences for large parts of the fishing fleet, if Harstad were to go out of action. Because the distance between the radio stations is greater here in the north than in the south. We have several places here in the north where

we cannot use other stations as replacements, if an accident happens and one of the stations is put out of action due to fire or technical failure. It should also be considered that the majority of the fishing fleet does not have such powerful, up-to-date radio equipment as larger vessels and oil platforms. So we have always maintained that it is important to keep the station in Tromso, above all for safety reasons," Christensen says.

Action section chief Knut Stafne in the Telecommunications Administration explains that this is the first time fire has broken out, disabling the remote-control unit at a station in this country. "You can, after all, never protect yourself against an accident, and we will now give greater consideration to what must be done as regards new equipment at Farsund and further installation of remote control at the other coastal radio stations," Stafne says.



1. VHF coastal stations in operation 1 October 1975
2. VHF coastal stations planned for 1975-76
3. MF coastal radio equipment

The Telecommunications Administration is planning ten central remote-control stations along the coast: Vardo, Hammerfest, Harstad, Bodo, Oerlandet, Aalesund, Floro, Rogaland, Farsund and Tjoeme. Seven of these have already been adapted to the remote-control system. In the years between now and 1981 Harstad will remote-control Tromso, Bergen will be controlled from Floro and Roervik will be remote-controlled from Oerlandet Radio.

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BRIEFS

PRIVATE BROADCASTING STATIONS--GTE has just installed the largest Spanish private network of telecommunications by wireless beam, serving one of the country's largest hydroelectric companies. This achievement was the result of a contract for $2.2 million (approximately 11.1 million francs). The network transmits computerized information to the stations spread out along its 1,280-km course in order to control the production and distribution of electric current to several of Spain's large cities. The system, starting from Morata, near Madrid, has a capacity of 300 channels for vocal transmissions and the transmission of data, as well as 10 terminals and 14 repeaters. A surveillance system, located in two strategic terminals, controls 22 terminals and distant stations furnishing the latest information to the system's control device. The equipment for this project was furnished by GTE Electronica SA, Madrid, and includes CTR 115B transmitters and receivers and the MP 25 multiplexers supplied by GTE Telecomunicazioni SpA, Milan, another branch of GTE. /Text/ /Paris ELECTRONIQUE ACTUALITES in French 21 Apr 78 p 87/ 8568

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FUTURE TELECOMMUNICATIONS DEVELOPMENTS DISCUSSED

Duesseldorf HANDELSBLATT in German 29 Mar 78 p 3

[Article by Dietrich Elias, state secretary: "Electronics Will Relieve the Mailman. Trends for Future Communications Systems"]

[Text] The highly automated telecommunications system, which requires large capital assets, is yielding increasingly higher cost surpluses--at present almost DM5 billion per year. On the other hand, the deficits in the postal system, which by its nature has high personnel requirements and cannot be automated to any great extent, have meanwhile shown, with a tendency to rise, an increase to about DM3 billion per year. In this matter the Federal German Postal Service DBP can no longer put off rate adjustments if it wants to avoid getting into the situation of having to effect such large jumps in the rates that the demand for postal services would drop off ruinously.

In terms of managerial operation the new rate policy is in order. In terms of managerial policy, however, it is sound only if the developments and shifts in demand, which undoubtedly go along with it, in and between the two service sectors can proceed without detrimental results for the national economy, for the individual customer and, not least, also for the overall enterprise itself. In this we have the fundamental question about the timely development and the scope of the replacement competition between electrical and physical transmission of information.

The catchword here is the "electronic letter." In fact, if, apart from the telex which already exists, this term brings together the office teletype facsimile transmission (Telefax) and possibly also the viewing screen text, then new means of communication are being offered here which, to a considerable extent, combine the advantages of electric information transmission, namely speed, availability at any time and opportunities for greater price reductions, with the present advantages of physical transmission of information, namely the documentary, written and visual representation.

In the FRG the DBP and the commission for the expansion of the technical communications system have been concerned with this problem. In this connection it was discovered that of the 36 million first-class letters each day about 20 million messages could be technically transmitted electronically. There is naturally uncertainty in appraising what will ultimately be realized from it in actual practice. This depends on the traffic flow between sender and receiver, between companies and authorities among one another (40 percent), between companies authorities with private parties (39 percent), from one private party to another (13 percent) and from private parties to authorities (8 percent).

If one assumes that because of the relatively high costs of the terminal units only business subscribers have office teletype equipment and telefax equipment at this disposal, and also that no all letters are transmitted electronically, then about 30 percent of the letters that can be transmitted electronically or about 16 percent of all letters sent by the electronic letter would still be first determined by the general economic development and the individual operational advantages.

Text preparation and processing, because of its advantages in the producing letters, has good prospects of gaining ground quickly and extensively in offices. Because of this, there is a rise in the prospects for the rapid spread of the office teletype and the direct transmission of letters via the telecommunications system to addressees with their own office teletype. Thus, it is especially suited to "normal" urgent business mail; in this regard the obvious advantages in the office organization and the speed are surely more important than the cost savings in postage.

Remote copying (telefax), in contrast to the office teletype, offers the advantage that handwriting and illustrations are transmitted in a natural form. Thus, it is particularly suited to the direct transmission of such messages which, for example, are needed in a form true to the original, for use as working materials or papers for discussion. The DBP is planning to introduce telefax service shortly.

Viewing screen text is also suited to rapid and simple information transmission between all parties. The limited, standardized selection of symbols and the stylized representation of the image naturally limit the extent of use. This disadvantage could, however, be compensated for a long-term basis by "fully supplying" every household with a telephone and television set. The prerequisite for this is a screen text supply that is reasonably priced. Then, among other things, even simple messages, such as preformulated and pictorially represented greetings and messages in telegram style, can be taken over by this new medium.

The DBP rate policy now planned takes these new technical developments into consideration and also reflects the various cost trends of material and immaterial information transmission. But it is also recognized that, contrary to different suspicions, letter mail service is not being dealt a

"death blow." As indicated, realistically considered, only about 16 percent of all first-class mail will be replaced in the next 10-15 years. In this connection consideration was never even given to the fact that there is a chance to compensate for this loss by the demonstrably steadily growing demand for information and communications in all industrial countries.

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